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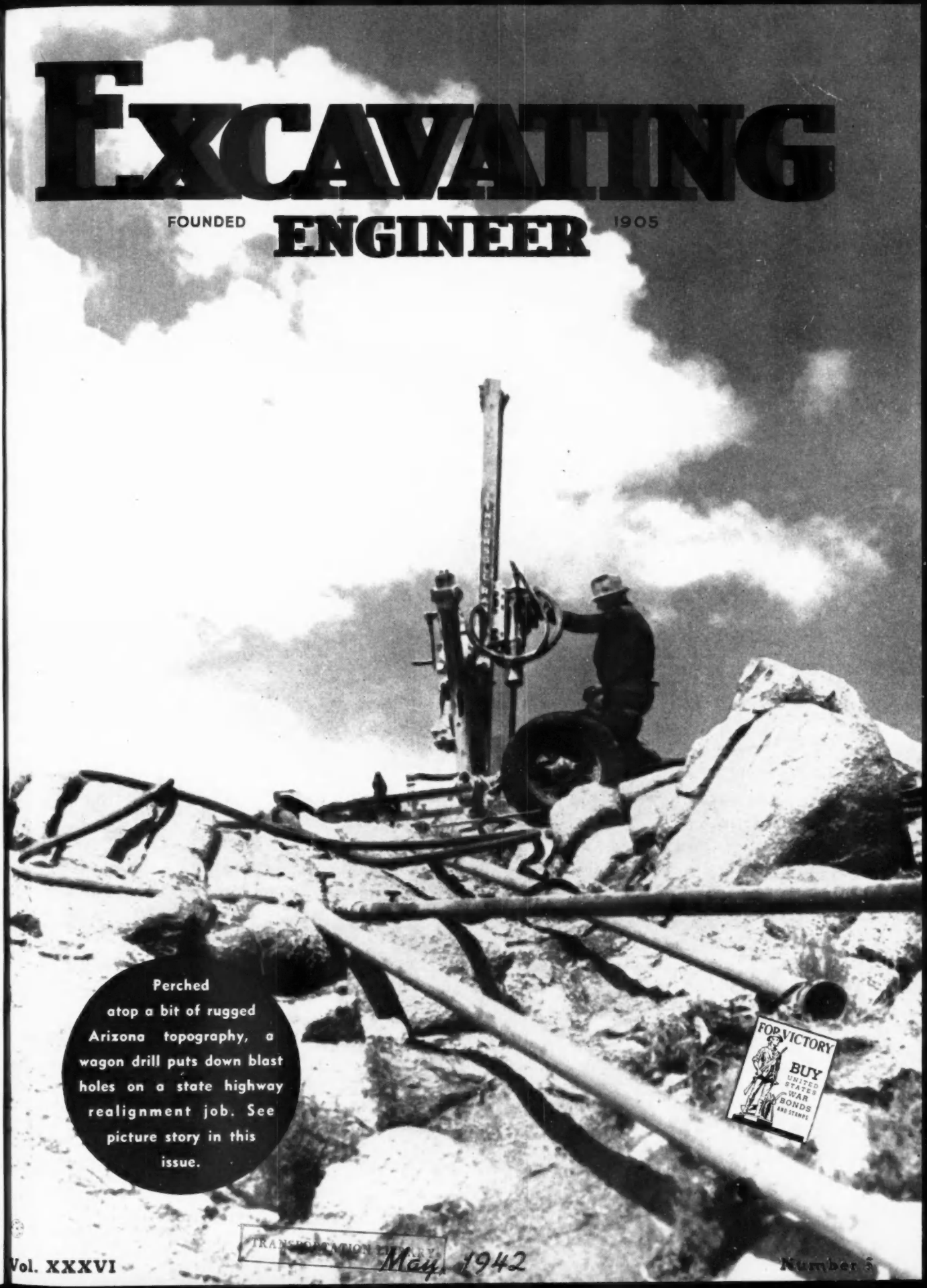

Perched atop a bit of rugged Arizona topography, a wagon drill puts down blast holes on a state highway realignment job. See picture story in this issue.

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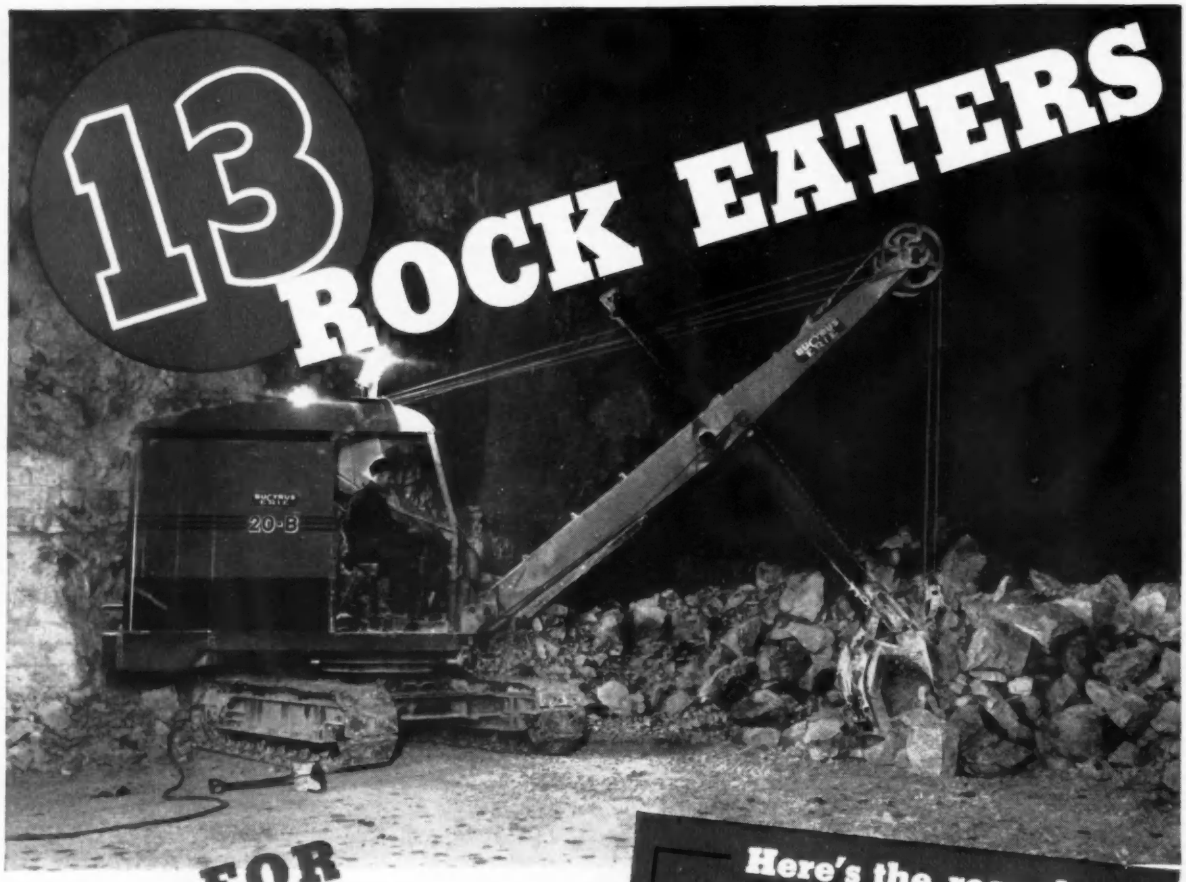
Vol. XXXVI May, 1942 Number 5



FOR Kentucky Stone Company

In the Fall of 1935, Kentucky Stone Company purchased the first of its small gasoline-powered full-revolving Bucyrus-Eries. Eleven additional Bucyrus-Eries have already followed that first one into Kentucky Stone Company quarries, and the 13th is on its way.

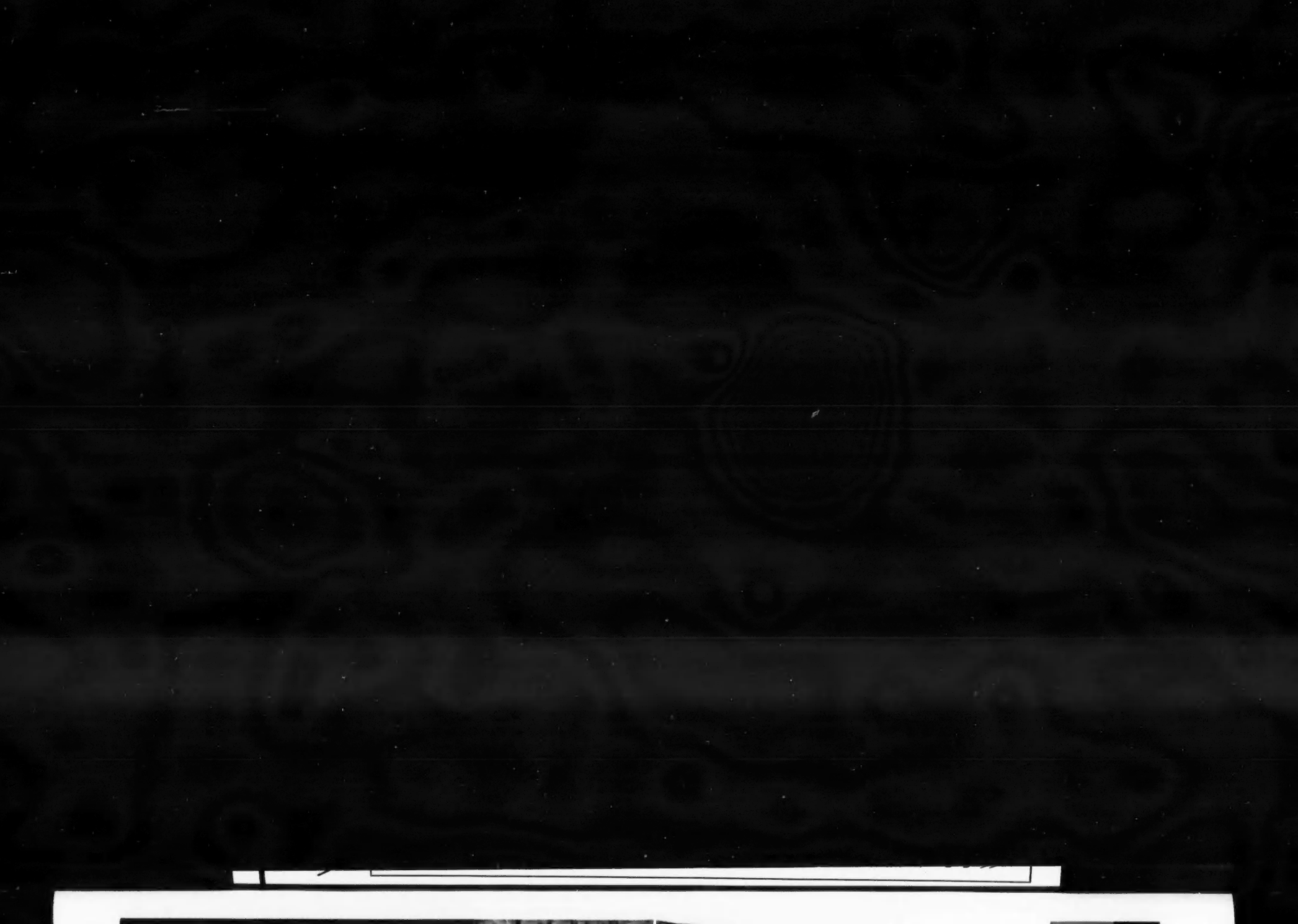
The proof of the pudding is in the eating. Two of every three Bucyrus-Eries sold are repeat orders, based on first-hand knowledge of Bucyrus-Erie performance.

Here's the record

MODEL	CAPACITY	DATE SHIPPED
10-B	3/8-yard	Oct. 4, 1935
10-B	3/8-yard	Sept. 24, 1936
19-B	5/8-yard	June 3, 1937
19-B	5/8-yard	Sept. 25, 1937
20-B	3/4-yard	July 22, 1938
20-B	3/4-yard	Oct. 10, 1938
20-B	3/4-yard	April 15, 1940
20-B	3/4-yard	April 17, 1940
20-B	3/4-yard	May 21, 1940
20-B	3/4-yard	Feb. 24, 1941
20-B	3/4-yard	Feb. 26, 1941
20-B	3/4-yard	Mar. 17, 1941
20-B	3/4-yard	Early 1942

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN



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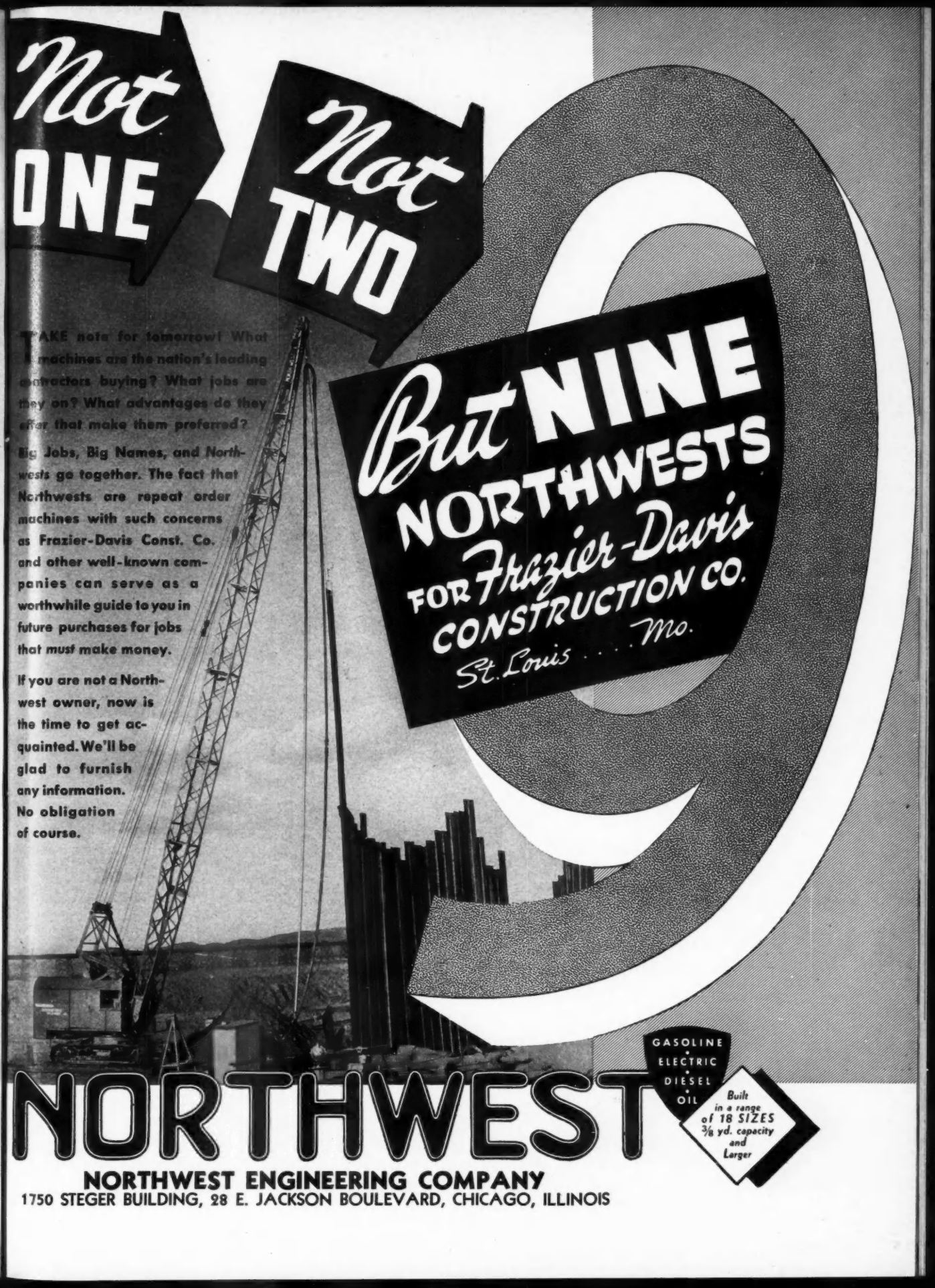
CRAWLER WAGONS • ROTARY SCRAPERS • TAMPING ROLLERS

EUCLID THE PIONEER

For your convenience in writing to The Euclid Road Machinery Co., you will find a card be[illegible] in this issue.


Not ONE
Not TWO
But NINE
NORTHWESTS
FOR Frazier-Davis
CONSTRUCTION CO.
St. Louis . . . Mo.
TAKE note for tomorrow! What machines are the nation's leading contractors buying? What jobs are they on? What advantages do they offer that make them preferred?
Big Jobs, Big Names, and Northwests go together. The fact that Northwests are repeat order machines with such concerns as Frazier-Davis Const. Co. and other well-known companies can serve as a worthwhile guide to you in future purchases for jobs that must make money.
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1750 STEGER BUILDING, 28 E. JACKSON BOULEVARD, CHICAGO, ILLINOIS

Fast digging, hauling and compacting is the rule at Denison Dam as Guy F. Atkinson Company keeps ahead of its 30,000,000-yard contract to build the world's largest rolled-fill dam

By SPENCER JONES

DENISON DAM, the world's largest rolled-fill embankment, is now under construction across the Red River on the border line between Texas and Oklahoma four miles north of Denison, Texas. The nation's largest earthen dam is at Fort Peck, Montana, but this is a hydraulic fill, which places it in a separate category from Denison Dam's rolled-fill structure. Hansen Dam, near Los Angeles, California, currently holds the record as the largest rolled-fill dam, but it will yield to this new Red River project.

The new Denison Dam will have a crest length of 17,200 feet, including the spillway width; a height of 165 feet, with its crest at an elevation of 670 feet above mean sea level; and a thickness of 1,150 feet at the base, diminishing to 40 feet at the crest. Three miles north of the main embankment, 7,800 linear feet of dike 15 feet high is required to close a low saddle. Including this dike, a total of 30,000,000 cubic yards of earth and rock must be excavated, transported, deposited and compacted in the construction of permanent and coffer dams.

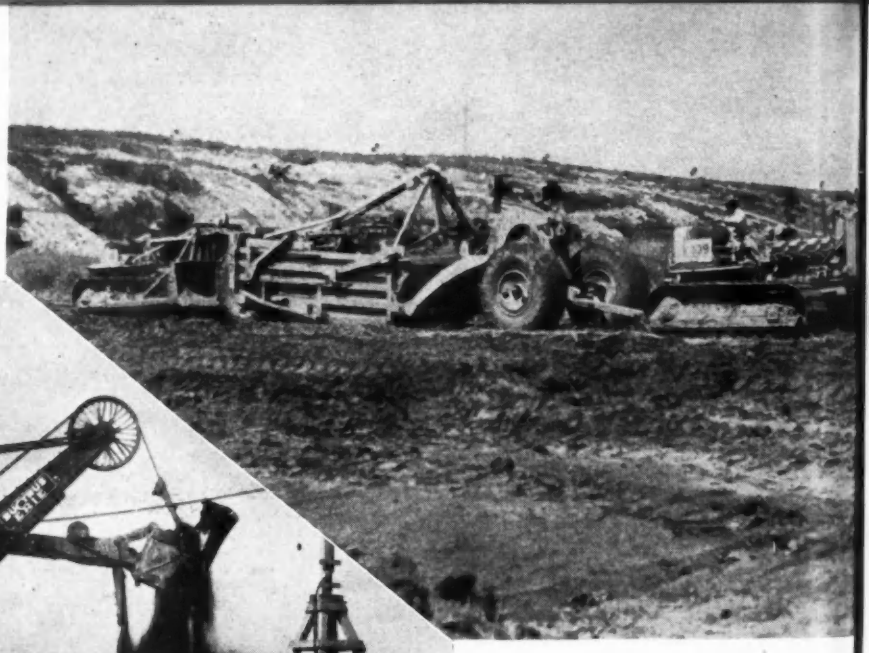
In the main embankment, 17,400,000 cubic yards of earth fill will be used, together with 455,000 cubic yards of derrick stone, riprap, spalls, coarse gravel and sand for embankment protection. The excavation for the outlet works involved the removal of 3,000,000 cubic yards of earth and rock. From the site of the main embankment 10,000 cubic yards had to be blasted out, together with 4,000,000 cubic yards of rock from the spillway site. An upstream coffer dam required 490,000 cubic yards of earth, while a downstream coffer dam took another 30,000 cubic yards.

At its spillway crest elevation of 640 feet, Denison Dam will impound more than 6,500,000 acre feet, inundating 41,000 acres in Texas and 105,000 acres in Oklahoma. This man-made lake will have a shore line of 1,250 miles, extending 55 miles up the Red River and 36 miles up the Washita River, which joins the Red River a few miles above the new dam.

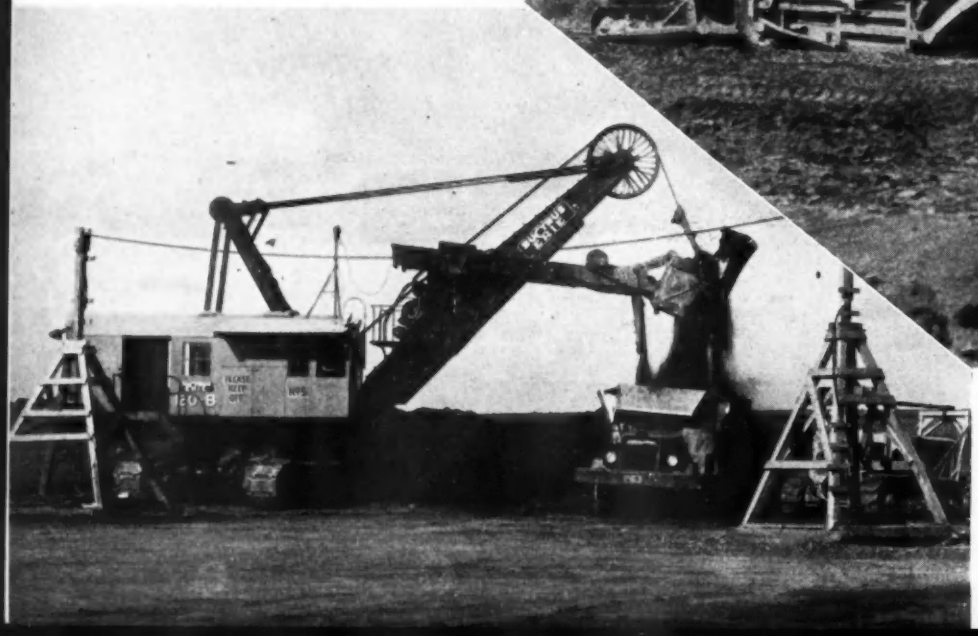
Purpose of the Project

To explain why such a huge dam is being built in a section of ordinarily adequate rainfall, it should be stated that this is purely a power and flood control project, with a possible navigation angle.

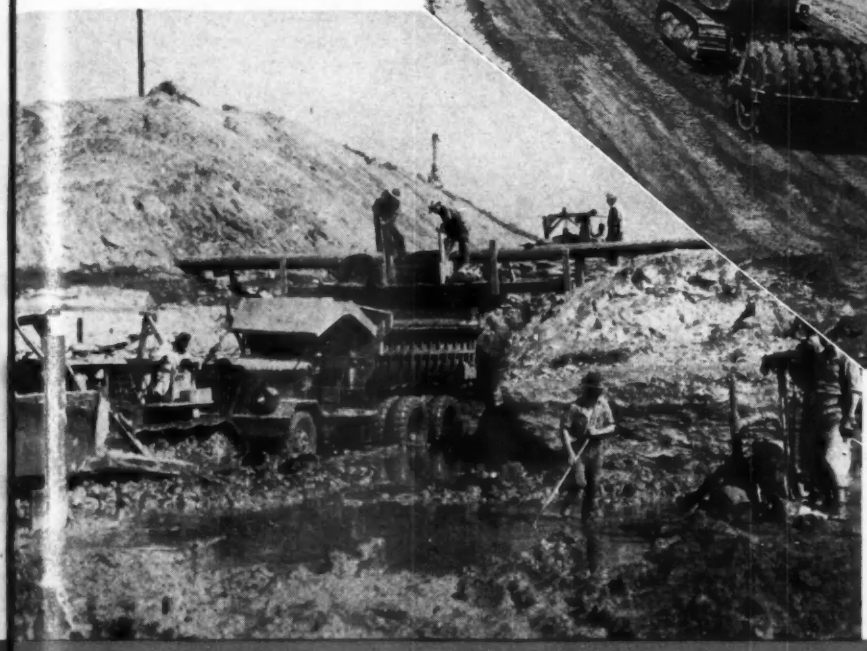
"ALL OUT" DIRT MO



• Below: Borrow excavation for the 17,400,000 yards of earth fill needed for Denison Dam is one of the major operations. Here, a Bucyrus-Erie 120-B electric loads out fill material to a 20-yard Sterling truck.



• Above: Powered by Caterpillar D-8 tractors fore and aft, a 20-yard LeTourneau scraper strips the foundation area of the dam's main embankment. This material was wasted to three disposal areas.



• Below: Cleaning muck out of the cut-off trench. Bulldozer on top shoves muck into wooden trough equipped with an end gate to allow loading to the waiting truck. Tractor below helps trucks out of this mucky spot.

• Above: An embankment washout caused by heavy rains is repaired with pervious material compacted by a 2-drum sheepsfoot roller in the tow of a Caterpillar D-8.

NG AT DENISON DAM

The Red River, one of the larger streams flowing into the Mississippi, is officially a navigable stream from the Arkansas-Oklahoma line to its mouth, 543 miles southeast. Actually, its poorly defined low-water channel, winding along an irregular course and shifting at will, is hardly practicable for year-round navigation. Years ago, however, steamboating flourished on the Red River. Traffic as far inland as Shreveport was seldom practicable more than six months a year, and only occasionally were boats able to reach Denison.

The months of May, June and October see the Red River at its highest stages, with a maximum recorded flow of nearly 420,000 cfs, about 210 times greater than its average discharge at the government gauging station near Denison. With such variations in flow along a winding, shifting channel, it is not surprising that Red River steamboat pilots demanded and received salaries of $700 per month and, with the coming of the railroads, commercial navigation practically ceased.

Many Denison folks hope that the new Denison Dam will be of major assistance in making the Red River again commercially navigable, believing that the stabilization of stream flow by the regulated discharge from the dam will help to keep the river below Denison confined to a more stable and constant-depth channel. Whether or not their hopes are justified, it is reasonably certain that devastating floods will no longer ruin millions of dollars worth of crops, farm buildings and rich bottom land below the storage reservoir.

The water impounded by Denison Dam will actually be a three-story lake. The lower story will hold back 1,020,000 acre feet, permanently devoted to the accumulation of silt and the dead storage

Principal Excavating and Hauling Equipment at Denison Dam

No.	Size	Model	Make	Type
3	5-yd.	120-B	Bucyrus-Erie	shovel, dragline
2	2½-yd.	54-B	Bucyrus-Erie	shovel, dragline, piledriver
1		50-B	Bucyrus-Erie	piledriver
1	1¼-yd.	75-A	Lorain	shovel, dragline
1	10 ton		Browning	truck crane
4	20-yd.	RU	LeTourneau	scrapers
3	12-yd.	J-13	LeTourneau	scrapers
22	11-ft. blade		LeTourneau	bulldozers
24		D-8	Caterpillar	tractors
20	20-yd.	diesel	Sterling	trucks
20	20-yd.	diesel	Western	trucks
16	4-yd.	gas	Dodge	trucks
12	13-yd.	diesel	Euclid	wagons

• Guy F. Atkinson Company's Denison Dam operations are headed by (L to R) C. E. Ferguson, master mechanic; A. E. Holt, vice-president; and A. H. Steiner, general superintendent.

of water; the second story will hold back 2,060,000 acre feet, devoted to power production; and the third and top story will hold back 3,473,000 acre feet if the outlet gates are closed. Dead storage will be from the river bed to elevation 587; power storage from elevation 587 to elevation 617; and flood storage from elevation 617 to elevation 640, the spillway crest. The embankment crest is at elevation 670, which would mean that a flow of water thirty feet deep would have to be passing over the 2,000-foot width of spillway before the impounded water could rise high enough to flow over the 24-foot-wide road that will run along the crest of the dam.

Such a critical situation is hardly likely to arise, for only once since Red River records have been kept has there been enough water flow to fill the impounded reservoir of Denison Dam to the height of the ogee spillway crest. And this concrete structure will have a discharge capacity of 1,000,000 cfs.

Planning and construction of Denison Dam are under the direction of the division engineer, United States Engineer Office, Southwestern Division, Little Rock, Arkansas; and under the immediate supervision of the district engineer, United States Engineer Office, Denison, Texas, Lt. Colonel W. W. Wanamaker. At the Denison office, Capt. Erland A. Tillman is assistant to the Denison District army engineer; A. L. Allan, chief of the Engineering Division; and H. L. Johnson, chief of operations. C. R. Brown is resident engineer. The United States Government is, of course, acquiring all the land involved in the Denison Dam project, and it owns the structures built on this land.

The late Dr. Alex W. Acheson, colorful Denison pioneer, first directed public attention to the Red River some forty years ago during a relentless war he waged to make the stream safely and continually navigable, but his idea did not include a dam. It was another Denisonian, George D. Moulton, who in 1926, had the vision of a gigantic power and flood control dam across the Red River north of Dension. After years of hard work by thousands of enthusiastic supporters of the idea, Denison Dam took its first step toward reality when a survey of the project was authorized under the National Flood Control Act of 1936. A U. S. Engineer Office was opened in Denison and the survey was completed in 1937. Congress authorized the project in 1938 at an estimated cost of $54,000,000. In 1939, President Roosevelt signed a War Department appropriation which included a $5,700,000 allotment for first-year construction work.

Early Contract Operations

Clearing of the sparsely wooded site began August 3, 1939, and was done by the Schutt Construction Company of Genoa, Wisconsin. The second contract, for the excavation of the outlet works area in the Texas (south) abutment, was let shortly after to the Condon-Kerns Construction Companies (Geo. W. Condon Company and John Kerns Construction Co.) on their bid of $761,450 for 3,100,000 cubic yards of excavation and the construction of a pile bent bridge across the Red River to serve as a construction facility during the early phases of the project. This contract was completed in April, 1940.

The third contract, which provided for the construction of the outlet works, was awarded to C. F. Lytle Construction Company of Sioux City, Iowa, on its bid of $3,470,640. This contract, on which work started in February, 1940, was completed in April, 1942. It included the construction of a paved approach channel, an intake structure, eight reinforced concrete conduits, a stilling basin and service bridge. Chief reason for the early construction of the outlet works was to make it possible to divert the river by means of a coffer dam during construction of the embankment.

The intake structure, built of reinforced concrete, is 260 feet wide, and its upstream side will always be more or less submerged in the impounded lake. Each conduit opening in the intake structure has two gates 9 feet wide by 19 feet high, raised and lowered by a gantry crane which moves along the operating deck. The upstream conduit mouths are rectangular, with transition sections downstream from the gates to 20-foot diameter circular conduits. Certain conduits will serve the power plant, while other conduits (for flood control) empty directly into the stilling basin. More than 240,000 cubic yards of concrete was used in the construction of these outlet works.

The hydroelectric power plant will develop many thousand kilowatts of electricity with its huge generators, two of which are now being built by a firm in Pennsylvania.

The bids for the fourth contract, which includes the construction of the huge rolled-fill embankment and the excavation for the spillway, were opened on April 15, 1940, and the Guy F. Atkinson Company, of San Francisco, California, was the low bidder at a price of $8,228,465. The contract was officially awarded May 17, 1940, and work began May 22, 1940.

Headed by A. E. Holt, vice-president and general manager of the Guy F. Atkinson Company's work at the Denison Dam, the key personnel of the contractor's organization was faced with the problem of excavating and moving a lot of earth and rock fast. Only

1,050 working days were allowed to excavate, transport and place 30,000,000 cubic yards.

Embankment and Borrow Areas

In the spillway at the Texas end of the embankment there were 10,800,000 cubic yards of excavation, including about 4,000,000 cubic yards of rock in the approximately 100 feet of Kiamichi shale and alternating layers of limestone which had to be removed. Building of the main embankment, mostly in Oklahoma, required the removal of only about 10,000 cubic yards of limestone, which test borings revealed in the Oklahoma terrace at the north end of the dam and in the Texas terrace at the south end of the dam north of the outlet works.

The site of the embankment, as well as 13 borrow areas, had to be grubbed by the contractor. Then the embankment site and borrow areas had to be selectively stripped, with the top six inches of the embankment site stripping amounting to 160,000 cubic yards, wasted to three disposal areas, and the topsoil from four of the borrow areas and a portion of the spillway excavation, amounting to 151,500 cubic yards, dumped in storage areas for future spreading on the downstream slope of the embankment. All foundation stripping for the 7,800 feet of 15-foot-high dike three miles north of the main embankment was to be wasted.

Approximately 8,395,000 cubic yards of impervious fill had to be excavated from eight borrow areas and transported, dumped and compacted on the six work areas of the main embankment, on its upstream side. Approximately 4,159,300 cubic yards of pervious fill had to be excavated from a single borrow pit and transported, dumped and compacted on the lower portion of the downstream side of the six work areas of the main embankment. Approximately 5,564,500 cubic yards of random pervious fill had to be excavated from three borrow areas and transported, dumped and compacted above the pervious fill on the six work areas of the main embankment. Approximately 840,000 cubic yards of blanket material had to be excavated from two borrow pits and transported and dumped at the toe of the upstream side of two work areas of the main embankment where embankment height was at a maximum.

Just to make matters a little more complicated, a small item of about 8,606,900 cubic yards of material had to be wasted from three borrow areas and four excavation areas (exclusive of the main embankment) onto nine disposal areas, a berm and a borrow pit. Also a trifling 750,000 cubic yards of material had to be excavated from a borrow pit, the river bed (sand), and an embankment foundation trench in one of the work areas, to be used as berm and transported and dumped at the downstream toe of the embankment in two work areas where the embankment was highest.

Gravel and sand for road drains, blanket for upstream protection, blanket for bridge approach riprap and blanket for approach channel riprap totaled 102,000 cubic yards, all from one borrow area. Spalls for upstream protection; riprap for upstream protection, downstream protection, approach channel, access bridge approach and surface drain outfalls; and derrick stone for downstream protection totaled 212,200 cubic yards, with acceptable stone obtainable 65 miles away in Oklahoma.

Another complicating factor, and probably the most important

(Continued on page 254)

• **Top: A Caterpillar D-8, equipped with a LeTourneau bulldozer, spreads material dumped by a 20-yard Western truck to improve a hauling road. Bottom: This material was excavated by a 2½-yard Bucyrus-Erie shovel working in a borrow area.**

Hard rock road job

By FLOYD SUTER BIXBY

Ten miles west of Globe, Arizona, early morning traffic sped east and west over U. S. Highways 60 and 70. Crimson heat dripped from the rising sun, staining the gray granite canyon walls that reverberated the staccato beat of air compressors.

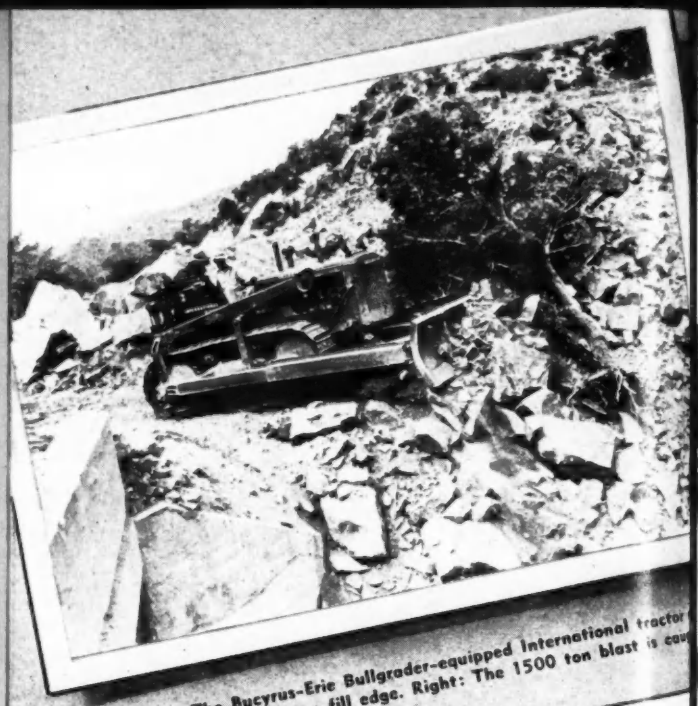
Suddenly, flagmen waved oncoming traffic to a halt. About 1500 tons of Swartz granite, loaded heavily with explosives, was ready to be blown to bits. An International tractor equipped with a Bucyrus-Erie Bullgrader stood ready at the line of traffic to clean up the mess.

Whoom! The granite point twisted and heaved like a sick thing, and, when the small rock fragments, blown hundreds of feet into the air, had settled to the earth, 1500 tons of granite lay strewn over the road, bleeding blue smoke from broken pieces.

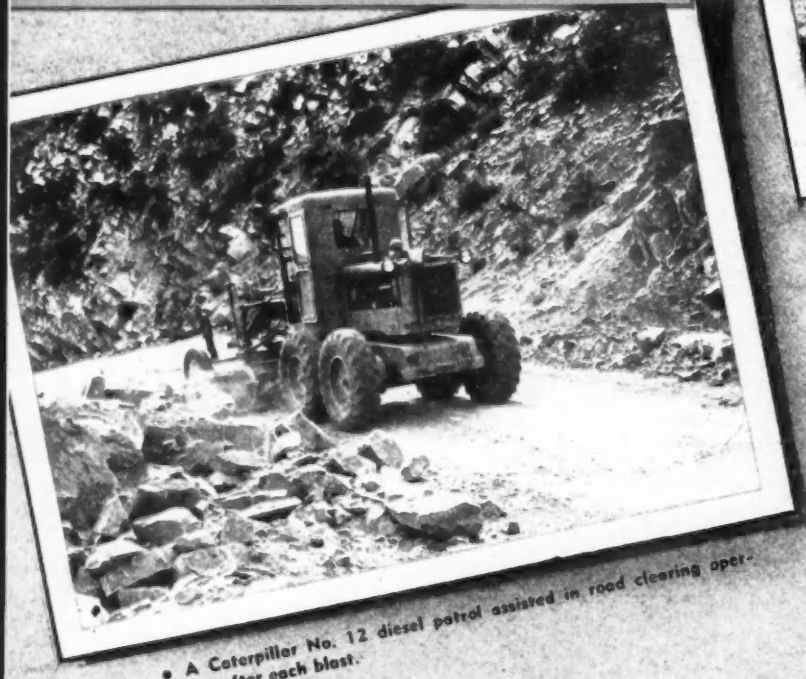
Fifteen minutes later, the waiting automobiles trickled through a passageway cut through the broken rock by the busy tractor. With its Bullgrader blade lowered, the machine had pushed tons and tons of the hardest kind of stone out of the way. Then, when the stream of automobiles had passed, the tractor went to work again, and by the same afternoon 1500 tons of rock had been moved out of the way.

This job, involving nothing but hard rock excavation, straightened a part of U. S. Highways 60 and 70. "Realign the road" had been the order given by the Arizona State Highway Department and so Resident Engineer R. D. Canfield moved in necessary equipment and began blasting.

The accompanying pictures tell the rest of the story of a typical Arizona highway improvement job.



• Above: The Bucyrus-Erie Bullgrader-equipped International tractor a bladeful of rock over a fill edge. Right: The 1500 ton blast is cau mid-air by the author's camera.



• A Caterpillar No. 12 diesel patrol assisted in road clearing operations after each blast.

• Right: Arizona Highway Department's job headquarters for this section of the new route between Phoenix and El Paso housed field lubrication and maintenance facilities.

• Secondary shooting with jack-hammer-drilled holes was necessary to budge some of the big boys.

General view
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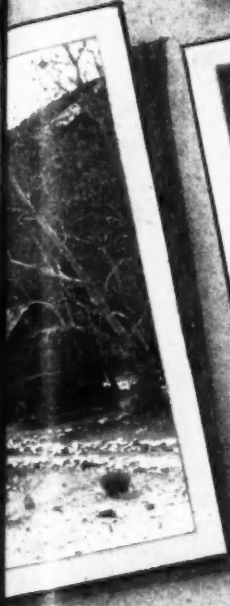
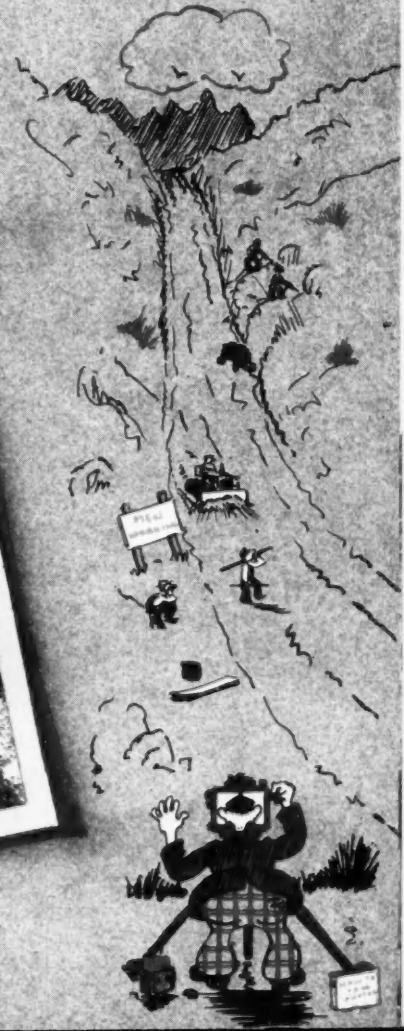


• Against a backdrop of rugged Arizona topography, the tractor clears away broken rock left by the blast.



Placer Mining Ground With A Stripping Shovel

Spruce Creek Placers, Ltd., of British Columbia solve their gold mining problems with a specially designed 2-yard stripping shovel

Editor's Note: This article is based largely on material appearing in the March, 1942, issue of Mining World and is being reprinted by their permission.

PROBLEMS MET in mining the deep, narrow placer ground of the Atlin district of extreme northwestern British Columbia, Canada, were solved handily last season by Spruce Creek Placers, Ltd., which brought to its Spruce Creek property the first high-lift stripping shovel ever to be employed in the gold placers of North America.

Spruce Creek Placers, Ltd., is the newest of the McRae-Patty enterprises. The property is on Spruce Creek, about eight miles by gravel road from the town of Atlin, which is situated on Lake Atlin one of the great lakes of breath-taking beauty which are the headwaters of the Yukon River.

Major General A. D. McRae of Vancouver, B. C., and associates became interested in placer gold operations in 1934. Since then an aggressive prospect drilling program has been carried on in Alaska, Yukon Territory and Northern British Columbia. This has resulted in the development of a chain of successful placer mining operations.

Practice of the McRae-Patty organization is to have separate corporations for its various enterprises. Ernest N. Patty is general manager of all. The interests include: Alluvial Golds, Inc., operating a Johnson dredge on Woodchopper Creek, Alaska; Gold Placers, Inc., mining Coal Creek, Alaska, with a Johnson dredge; Clear Creek Placers, Ltd., working a ground-sluicing operation with a Bucyrus-Erie dragline on Clear Creek, Yukon Territory; and Spruce Creek Placers, Ltd., here described. William A. O'Neill is assistant manager, in charge of Canadian operations.

The Atlin District of British Columbia has been mined for ap-

proximately 40 years, yielding consistently, and largely to drift methods. In recent years perhaps 75% of the gold from the immediate vicinity of Atlin has come from Spruce Creek and the neighboring Pine Creek.

The gold enriching the present Spruce Creek gravels was deposited during the Tertiary period, when Spruce Creek flowed through a mature valley into Atlin Lake, depositing a gold placer of deep oxide red gravel, slightly cemented by ferruginous waters over a valley floor approximately 1,000 feet in width. Later, the region was covered by glacial ice, which laid vast deposits of morainal material over such placers as were not removed by glacial action.

Water from the retreating glaciers re-established Spruce Creek, which cut a deep, V-shaped trench through the hills of glacial till. Today this valley floor is 120 to 200 feet wide, while the hills rise sharply on either hand from 400 to 600 feet. Depth of gravel in the bottom of the trench varies from 45 to 60 feet and is commercial over the full width of the floor. Further upstream, on adjacent ground, the gravel reaches 100-foot depth.

The early prospectors in about 1900 sank shafts in the valley floor, seeking to mine the deposits by drifting, but the water drove them out and forced them to drift-mine on Spruce Creek by inclined shafts driven back under the glacial till of the valley sides. Drift-mine values are found largely in the "Tertiary red" gravels, partially cemented by iron.

This has permitted extensive drifting under the hills bordering the present Spruce Creek trench. Efforts have been made to crosscut under the present valley, but loose ground and heavy water flow balked this work.

Deposit Mining Problems

In 1940 the McRae-Patty interests test-drilled this deposit and found that, although high-grade, it had characteristics which posed a knotty problem to the operator. For example:

a. The confined position of the placer, with the ground running only 120 to 200 feet wide between very precipitous banks.

b. The depth of the ground; and particularly the high ratio of depth to width, with its attendant problem of tailing disposal.

c. Presence of some large boulders, distributed through the deposit, as well as on bedrock.

d. Hard and irregular bedrock, which would be exceptionally difficult to clean with the usual methods and equipment.

e. Depth of gravel increasing upstream. This unusual condition results from the fact that the grade of the present valley floor is about 2%, while the bedrock is virtually flat.

f. An active stream in the narrow gulch, plus material volume of subsurface water.

It was originally planned to work the deposit by means of a dragline, but this program was eventually discarded. This was due largely to the question of whether a dragline could work safely above so high a face, plus doubt as to whether the digging action of a dragline bucket was sufficiently positive to get the gold under existing conditions of depth and bedrock.

In 1941, the company purchased a shovel that met the requirements of the job. The machine chosen was a Bucyrus-Erie 54-B stripper, equipped with a 2-yard dipper rigidly attached to a 32-foot handle, operated from a boom 45 feet in length. The shovel's maximum dumping height is 36'3" with the dumping door open, easily clearing the Spruce Creek maximum dumping height requirement of 31 feet.

This machine and its auxiliary equipment handled the difficult problem of mining the Spruce Creek trench to entire satisfaction, as will be described in detail later.

Job No. 1 in starting the mining was the diversion of Spruce Creek around the operations. This was accomplished with a flume 4,200 feet in length, 10-feet wide at the bottom and with vertical sides 50-inches high. It was designed to handle the largest freshets known on the stream. Location for the flume was benched out of the side hill, but 2,400 pieces of pole were required for supporting structure. The flume was heavily built, as testified by the fact that nearly four tons of nails went into its construction as well as 156,000 board feet of lumber.

Excavation Procedure

Operation plans called for the stripper and the tread-mounted washing plant to work on a dry bedrock, with tailings removed and stacked by a dragline working on the tailing pile.

The shovel worked to complete satisfaction. It broke the hard

• Spruce Creek Placers, Ltd., pans gold in the modern manner with this equipment lineup. The Bucyrus-Erie 2-yard stripping shovel in the foreground loads gold bearing material to the Johnson washing plant hopper. Tailings are tossed aside by the Northwest 2-yard dragline. Note flume diverting Spruce Creek in background.

• This crawler-mounted "dry bank" Johnson washing plant was specially designed for this operation to meet the maneuverability required of equipment working the narrow Spruce Creek area.

bedrock to a depth of 6 to 8 feet, where necessary, without difficulty and with entirely positive action. Moreover, its reach permits it to dig a face 120 feet in width without moving the washing plant. It works a face well over 45 feet in height without difficulty. Reach is sufficient to permit the shovel to stand back sufficiently to be out of danger, and at the same time to rake down the vertical bank by operating the dipper with the door open.

Power for this machine is furnished by a 207-hp Buda diesel operating at 1065 rpm. The stripper diverges from the standard Bucyrus-Erie 54-B shovel essentially in boom, handle and dipper, which have been modified and lightened to achieve great working range, both vertical and lateral, without sacrifice of stability.

The boom consists of twin box-section members, while the dipper handle is a cylindrical unit, free to roll in the saddle block, thus eliminating torsional stresses. The crowd action is rope-applied to the extreme end of the dipper handle, while there are two separate, two-part hoist ropes leading over twin boom-point sheaves.

The stripper delivers to a "dry-bank" washing plant built by the Walter W. Johnson Co., of San Francisco, and designed by that company's engineers, working in cooperation with Mr. Patty.

This plant represents the newest employment and extension of the gold recovery principles first worked out and put into practice by Tony Lindstrom, a pioneer Alaska dragline operator. The Bristol Bay Mining Co. works a Johnson plant of this general type on Wattamuse Creek, the Spruce Creek washer being a further development adapted for the special requirements of that operation.

The washer is crawler-mounted on its four corners, the crawlers being free to swing. The corners are also fitted with large hydraulic jacks, which are used for leveling the plant while operating, as well as for moving. All four jacks may be dropped and the plant lifted to permit the crawlers to be swung so the plant may be moved in any direction by the shovel or the International tractor equipped with Bucyrus-Erie bulldozer which serves the operation generally.

This flexibility of movement is distinctive, and entirely necessary under Spruce Creek conditions, where room for manuevering the washer is restricted. Although it is only necessary to move the washer when the width of the cut exceeds 120 feet, ability to move sideways is essential. The system worked to complete satisfaction during the initial season.

The shovel dipper dumps into a hopper, from which the gravel is nozzled over a plate punched with oval holes 1 by 1½ inches. Prior to the operation of the plant, Mr. Patty had some misgivings regarding the screening action of this plate, and provision was made to substitute a vibrating screen, if this should be necessary. Desire to eliminate all mechanical elements on the washer, however, led to adoption of the punched plate, and it gave complete satisfaction.

Screen undersize runs to a

• (L to R) E. N. Patty, general manager of the McRae-Patty enterprises; E. N. Patty, Jr., who was associated with his father in Alaska mining operations and is now in the U. S. Army Air Service; and J. B. Stam, Bucyrus-Erie Company's northwestern salesmanager.

series of riffled sluices, similar to dredge tables used under the trommel screen of a standard Johnson bucketline dredge. The first run of these tables is forward, the material then dropping to a second deck of tables sloping in the opposite direction. These in turn discharge into a long riffled sluice which delivers its material to waste well behind the washer.

Oversize from the punched plate rolls over a grizzly with bars spaced at 5-inches, and rocks passing these bars leave the plant on the sluice mentioned above. Plus 5-inch going over the grizzly tumbles into one of two rock chutes which drop their load on either hand at the rear of the washer.

These rock chutes serve to build up a windrow of large rocks close to the machine, while the tail sluice delivers behind this, assisting the dragline in stacking tails. Thus, the plant is so arranged that only minus 1 x 1½-inch material goes over the tables, where 80% of the recovery is effected. Larger material, and fines not taken by the screen, are passed over the riffled tail sluice.

Wash water is drawn from the timber flume, which is fitted with outlets every 300-feet. Natural pressure is sufficient for make-up water on the tables, but a pump is provided to deliver the pressure necessary for nozzling. This pump is a Byron-Jackson 10-L centrifugal, delivering 2,500 gpm against 50-foot head. It is direct connected by flexible coupling to a Caterpillar D-4600 diesel unit.

Tailings Disposal

Obviously, the matter of tailings disposal in a narrow canyon, with ground running from 45 to 60-feet in depth, presents a serious problem. A Northwest dragline powered with a Murphy diesel engine and swinging a 2-yard bucket is stationed on the tailings. It has an extra-length boom of 70-feet to permit it to pile rocks from the chutes in windrows, and also to side-cast material as far as possible up the side of the gulch.

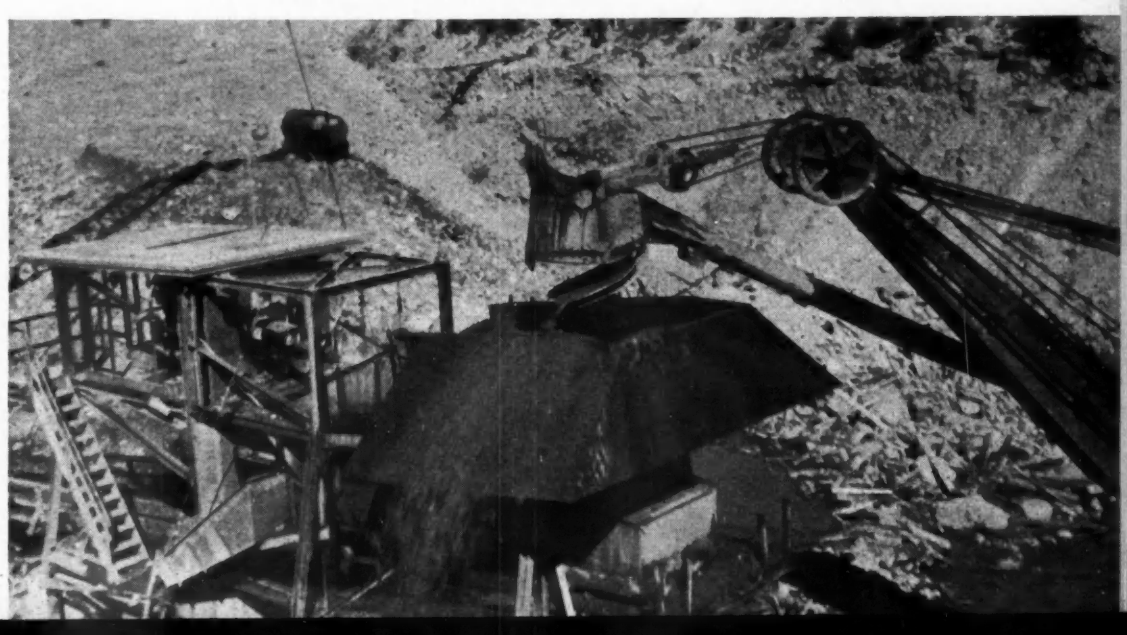
Although this requires double handling of at least a part of the material, it appears to be the only practical method of handling the tails under the conditions encountered. Some thought was given to a stacker conveyor, but this would have involved adding mechanical features to the washer. More important, however, it proved impossible to design a stacker which would deliver tails to the height required without seriously unbalancing the plant.

Water left in the pit, as well as that employed for gold washing, is removed by a timber drain laid on bedrock. This is framed with tunnel sets, well lagged, while the dragline piles boulders around it for drainage. Although some uneasiness was felt regarding this drain, it functioned perfectly during the 1941 season.

The Bucyrus-Erie stripping shovel being somewhat over-sized for the operation, which was desired, was able to loaf consistently, while keeping the washing plant and dragline at capacity. It demonstrated its ability to handle up to 3,000 cubic yards a day, although average yardage on Spruce Creek last season was only about half of that amount. In digging bedrock it was able to break the hard "greenstone" or meta-andesite bedrock to almost any required depth with little difficulty. Cost for cable and bucket teeth was less than in the case of a dragline engaged in similar duty.

When boulders up to 5 or 6 feet in diameter were encountered the

(Continued on page 276)



• Loading directly to the washing plant hopper, the Bucyrus-Erie 2-yd. stripping shovel makes use of 31 feet of its maximum dumping height of 36 feet 3 inches. About 80% of the plant's recovery is from the minus 1 x 1½-inch material.

Equipment

you ought to KNOW ABOUT

Dynamite cartridge

Manufacturer: Hercules Powder Company, Inc., Wilmington, Delaware.

Claims: The new cartridge, called "Tamptite," will expand under tamping to fill the bore hole and concentrate the charge with little or no spillage of powder, eliminating the necessity of slitting. The powder is packed in a waxed paper shell having a line

of perforations spiraled around the dynamite stick. These perforations are located on inner and outer layers in such a way as to prevent moisture from entering or ingredients leaking out. The cartridge unwraps slightly as it expands to fill the hole and telescopes to a shortened length at the same time.

Welding rod

Manufacturer: American Manganese Steel Division of The American Brake Shoe & Foundry Company, Chicago Heights, Illinois.

Claims: The Amsco V-Mang, has been developed to conserve nickel for the war effort. It is an alloy steel containing 12-14% manganese, molybdenum and other elements. The electrode will replace Amsco nickel-manganese steel electrodes, except in a few exceptional cases, thus conserving critical metal without hampering reclamation of manganese steel and other ferrous equipment parts, so vital at this time. While molybdenum is costlier than

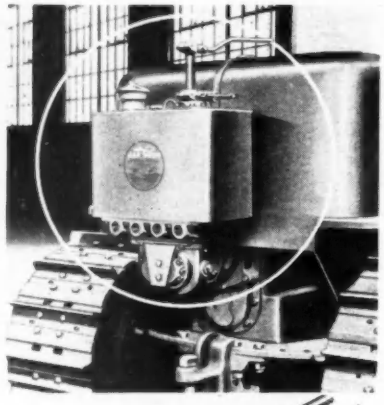
For further details about the equipment on this page please write to the manufacturer, mentioning Excavating Engineer.

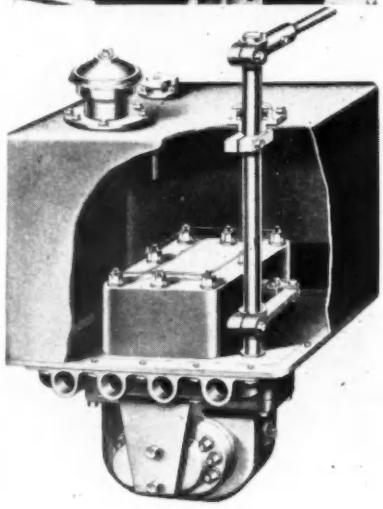
nickel, V-Mang is priced the same as Amsco nickel-manganese steel rod. It has been shown that the new rod can be applied as readily as the other and that it has ductility and tensile strength equal to, or better than nickel-manganese steel rod as applied. It is available bare and coated in $\frac{1}{8}$-in., $\frac{5}{32}$-in., $\frac{3}{16}$-in., and $\frac{1}{4}$-in. diameters in 18-in. lengths. Standard waterproof containers consist of 50 lbs. of rod.

Hydraulic control

Manufacturer: Gar-Wood Industries, Inc., Detroit, Michigan.

Claims: This tractor equipment control unit is simple in design



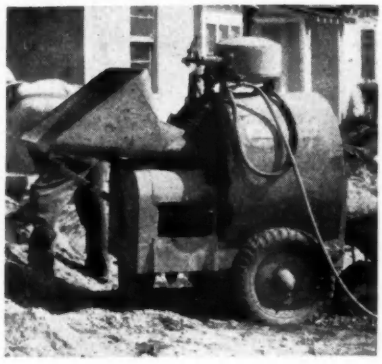


and the inner construction eliminates pipes, fittings and loss of oil. The large oil tank provides a greater supply and prevents oil from overheating. Ample oil passages throughout the valve, pump and lines reduce oil flow resistance to a minimum, resulting in cooler operation and higher efficiency. Two magnets are placed in the suction line of the pump to catch and hold any metallic particles that may enter the oil supply.

Non-tilting mixer

Manufacturer: Chain Belt Company, 1600 West Bruce Street, Milwaukee, Wisconsin.

Claims: This mixer has a 6-inch

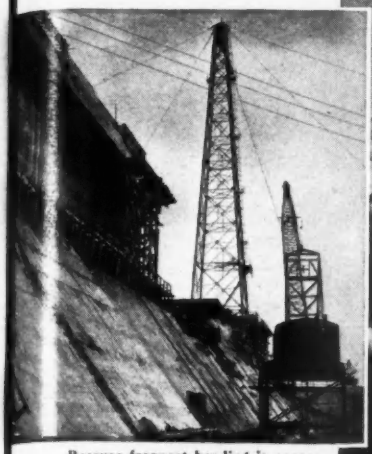


lower shoveling height which cuts as much as five miles of shoveling in five days of work. It has a self-cleaning hopper which has no hopper gate to jam with aggregates or cement. A hopper control is used that makes the stickiest material flow freely into the drum. The end-discharge mixer is mounted on two pneumatic tired wheels. It is equipped with a 3½ hp air-cooled motor.

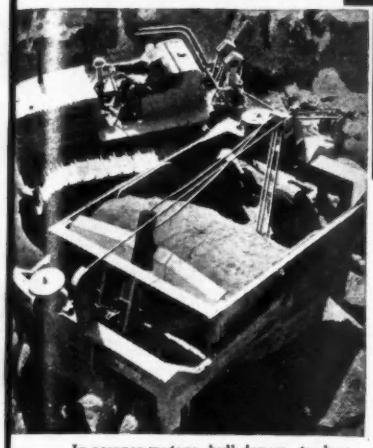
Drafting pencil

Manufacturer: TEC Pencil Company, 9381 Olympic Boulevard, Beverly Hills, California.

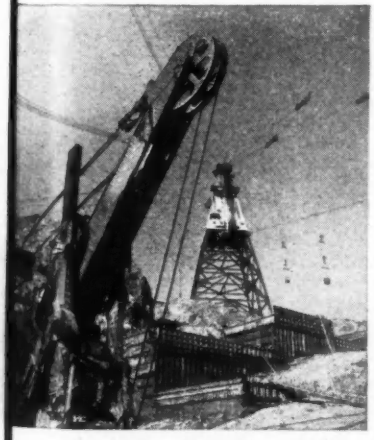
Claims: This drafting pencil has a full length lead tube of spring brass which is driven downward into the chuck point by a screw operating mechanism providing a positive grip on the lead and preventing any slippage or wobble. The usual clumsy metal tip has been eliminated.



Because frequent bending is necessary for this class of service, wire ropes for erection derricks should be free from liveliness and twisting tendencies. They should also have maximum fatigue-resisting properties. Tiger Brand Excellay Preformed meets all these requirements satisfactorily and economically.



In scraper wagons, bull dozers, graders and similar equipment, drums are unusually small, and overwinding cannot be avoided. Tiger Brand Excellay Preformed offers just the right combination of characteristics to resist the abuse, bending and abrasive conditions of such service.



On shovels, wire rope is required to bend repeatedly over drums and sheaves and is subjected to shock loads, vibration and external wear. Tiger Brand Excellay Preformed Wire Rope, because of its strength and superior fatigue-resisting properties, will improve service on this class of equipment.

Connecting American Tiger Brand Locked Coil Track Cable to cableway tower at Shasta Dam. Photo by courtesy U. S. Department of the Interior.

INDISPENSABLE TO AMERICA'S WAR EFFORT . . .

Good Wire Rope

Take care of what you have... use it properly... make it last longer

JUST check over in your mind the important equipment that requires wire rope for its operation — cableways, tramways, shovels, draglines, cranes, derricks, scrapers, to mention a few. Then think of the vital part such equipment is playing right now in the building of new plants, airports, army camps, roads and other vital war-time facilities.

Do you wonder that we say that *good* wire rope is indispensable for the success of our war program.

In American Tiger Brand Wire Rope we offer you the quality of rope you *must* have if you expect to meet the demands of war-time operation.

To help you get the most out of Tiger Brand Wire Rope we are prepared to help you select the right type of rope that will best suit your equipment and will gladly show you how to make it last under hard, continuous duty. Remember — every wire rope allowed to wear out prematurely is an unnecessary loss to the nation.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York

Excellay Preformed

USS UNITED STATES STEEL

Denison Dam

(Continued from page 245)

of all, was the fact that the U. S. Engineer Office insisted on certain optimum moisture content (18% to 20% in impervious fill and 12% to 14% in pervious fill) before it could be rolled on the embankment. This meant that the executives of the Guy F. Atkinson Company had to study weather reports for years past; estimate how many rainy days they were likely to have; and plan ways and means of excavating, moving, placing, and compacting the embankment material on those remaining days when its moisture content was acceptable or could be made so. Evaporation due to a long stretch of dry weather could be compensated easily by wetting the fill, but heavy rainfall would tie the job up for days at a time.

Obviously the problem was to select carefully, use wisely, and maintain properly excavating, transporting and compacting equipment that would, between rains, do the most work in the shortest time with a minimum of breakdowns. That the work has been continually ahead of schedule, despite the intervention of the wettest October for 40 years, is an indication that the executives of the Guy F. Atkinson Company have used good judgment in buying, using and maintaining their equipment.

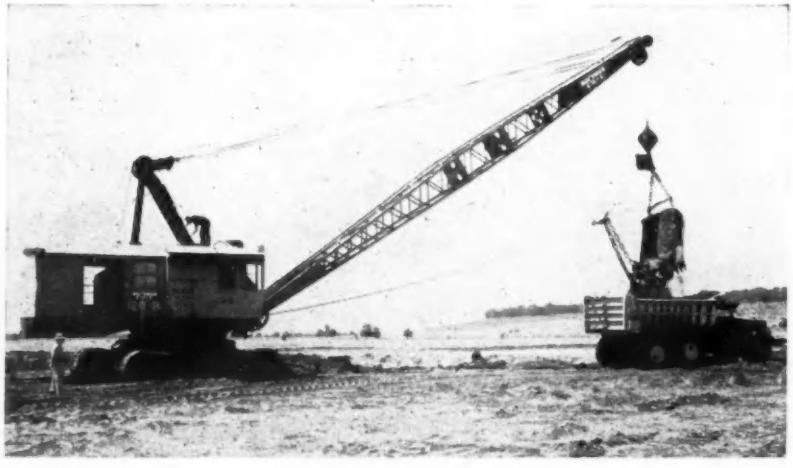
For stripping topsoil from the embankment site and four borrow areas, including topsoil from a portion of the spillway excavation,

• Pneumatic tampers are used to compact fill material near the steel sheet piling cut-off wall.

the contractor used four 20-yard RU LeTourneau scrapers and three 12-yard J-13 LeTourneau scrapers, all pulled by D-8 Caterpillar tractors. The same equipment did the balance of the embankment foundation stripping, dumping the earth in a berm which was incorporated in the pervious fill in the lower levels of the downstream portion of the embankment.

A little more than 2,000 linear feet of cutoff trench was called for, amounting to about 100,000 cubic yards. This excavation was made with a 120-B Bucyrus-Erie, working as a dragline with a 5½-yard Esco bucket on a 70-foot boom and also working as a shovel with a 5-yard Esco dipper. A 75-A Lorain dragline with a 1¼-yard bucket on a 45-foot boom assisted. Excavated material was transported and dumped on the berm with Sterling diesel trucks equipped with 20-yard Gar Wood bodies.

• Rigged as a dragline, a Bucyrus-Erie 120-B loads out borrow material to a 20-yard Sterling truck.

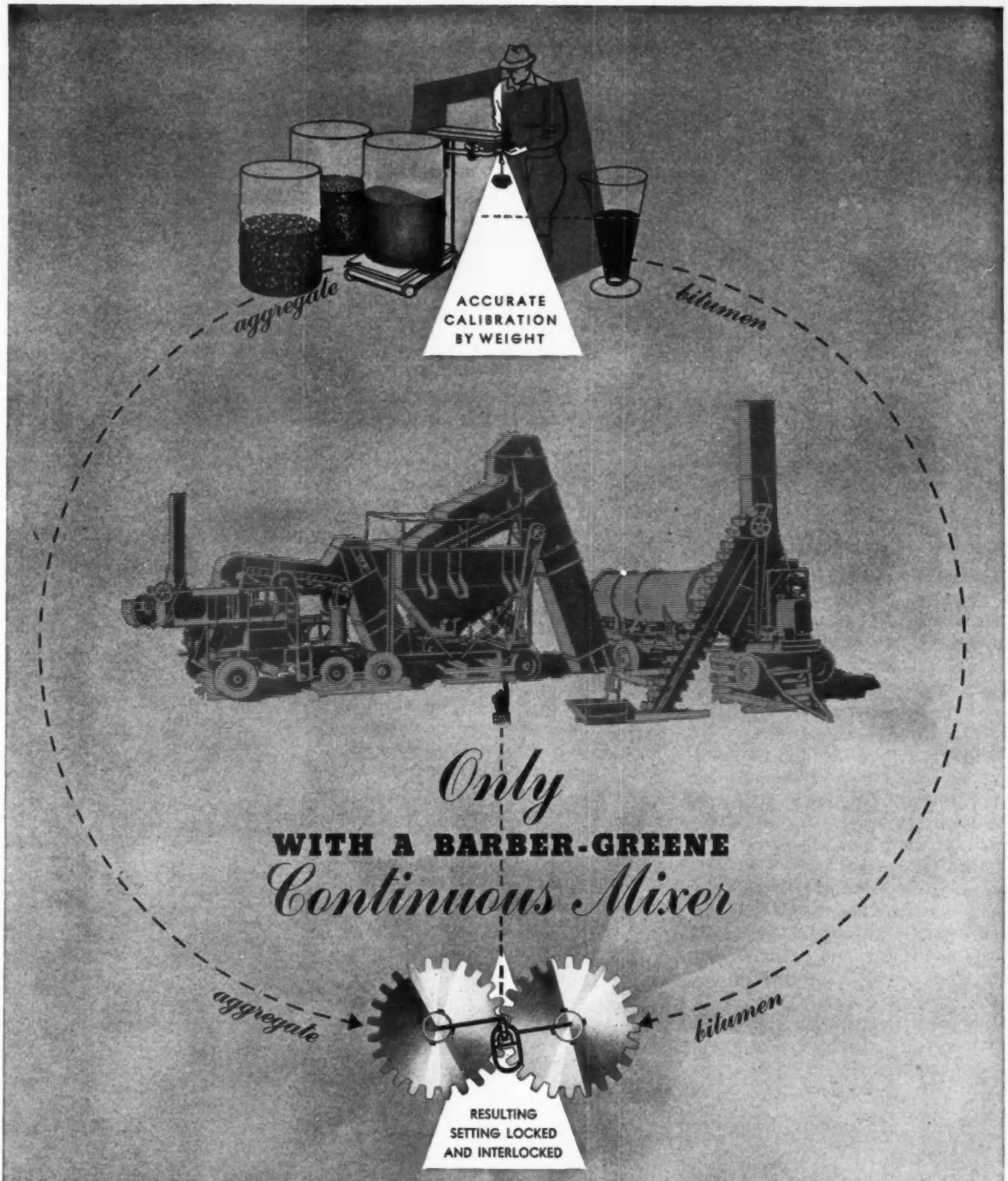


Instead of cutoff trenches for the rest of the main embankment, steel sheet piling, some of it in 70-foot lengths, was used for distances of about 2,800 feet south of the cutoff trench and 3,600 feet north of it. This sheet piling was driven with four different kinds of hammers, a No. 1 Vulcan, and three McKiernan-Terry hammers, a 9-B-3, a 10-B-3 and an 11-B-3. Two 54-B Bucyrus-Eries, using 80-foot booms and a Bucyrus-Erie 50-B steamer, also equipped with an 80-foot boom, were used with 75-foot and 100-foot leads in driving the steel sheet piling.

One of the 54-B Bucyrus-Eries was also used as a dragline on topsoil stripping in one of the borrow areas which was some 7,000 feet away from the main embankment. The 54-B loaded into diesel-powered 13-yard Euclids which hauled the topsoil to where it could be stockpiled for future use on the downstream slope of the main embankment.

Spillway Excavation

Excavation for the spillway was handled with an electric 120-B Bucyrus-Erie shovel, using a 6½-yard dipper in earth and a 5-yard dipper in rock; and the previously mentioned 54-B Bucyrus-Erie diesel shovel, using a 3-yard dipper in earth and a 2½-yard dipper in rock; the 75-A Lorain equipped



The simple procedure illustrated above accounts for the untiring accuracy of the Barber-Greene. The desired quantity of each size aggregate is weighed, and the feeder gates locked at this setting. The bitumen metering pump is set for the desired ratio, and mechanically interlocked with the aggregate feeder. The Barber-Greene achieves POSITIVE PROPORTIONING in bituminous mixing. Feeding these accurately proportioned materials into the twin pugmill in a proportioned continuous stream, the Barber-Greene easily delivers a uniform mix, ton after ton—mile after mile. The Barber-Greene has set entirely new standards for short inexpensive moving and set-up time. Investigate this ingenious machine. Complete literature on request. Barber-Greene Company, Aurora, Illinois.

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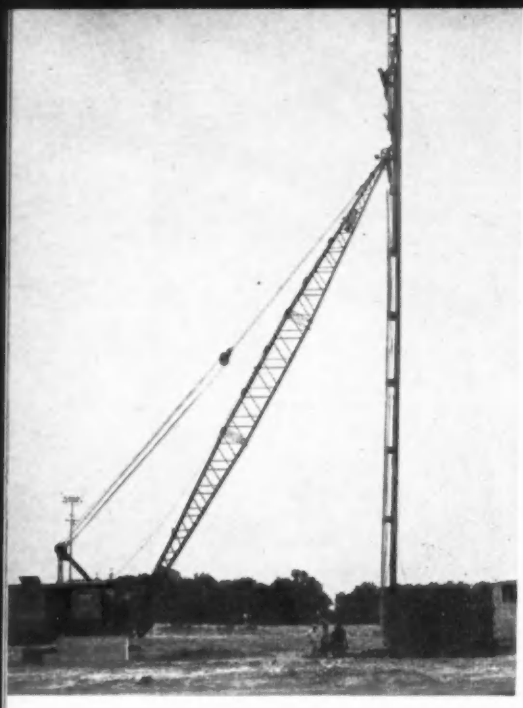
BG

BARBER GREENE

For your convenience in writing to Barber-Greene Company, you will find a card bound in this issue.



• One of the Atkinson Bucyrus-Erie 54-B's is put to work driving the steel sheet piling extension at each end of the main embankment cut-off trench.

with a 1¼-yard dipper; and the Bucyrus-Erie 50-B steamer, using a 2½-yard bucket. A total of 1,750,000 cubic yards of clay was borrowed from the spillway excavation's two borrow areas, plus 550,000 cubic yards from an intermediate borrow area on the Texas side of the Red River, and hauled in 20-yard Sterling and Western trucks and 4-yard Dodge trucks across an Atkinson-built bridge to be used as impervious fill in the main embankment.

Rock encountered in the spillway area was drilled in the deeper portions with Model FM-2 Ingersoll-Rand wagon drills. Bits were Ingersoll-Rand and Timken detachable, screwed onto hollow drill rods through which water or air, as needed, were forced. Diameter of bits for wagon-drilling was three inches and blast holes were usually drilled to depths of 14 or 15 feet, but never deeper than 20 feet. The Kiamichi shale was so soft that the contractor had a difficult time wet drilling but after considerable experimenting the proper use of water pressure tanks was determined and a satisfactory rate of drilling was obtained. The softness of the material dulled the detachable bits so slowly that sometimes ten or more blast holes could be drilled without removing the bit. Resharpening of the bits was done in the contractor's shops on the project.

Wagon-drilled blast holes were in staggered rows, 14 to 16 feet apart from hole to hole and row to row.

The contractor was limited by the U. S. Engineer Office to 500 pounds of explosive in any one shot, to prevent shattering of rock which was to be left in place. This meant that, if the blast holes were the maximum 20 feet in depth, only about 15 of them could be shot at one time. Shallower blast holes were shot in proportionately greater numbers at once. Atlas 30% and 40% gelatin in 2½" x 12" cartridges was loaded into the holes, stemmed with sand, and fired off of a 220 volt power line, using No. 6 blasting caps and a wired hook-up of various types, depending on the number of holes fired.

Shallower, smaller diameter blast holes were drilled dry with Gardner-Denver jackhammers using 1½" detachable Timken bits. These holes were loaded with 40% Atlas gelatin in 1⅛" x 8" cartridges, detonated with No. 6 blasting caps and fired off of a 220 volt power line.

Air for the wagon drills and jackhammers at 90 to 100 pounds pressure was supplied by two 500 cfm portable diesel Ingersoll-Rand compressors (for the wagon drills) and one diesel and one gasoline Gardner-Denver portable compressor, each of 315 cfm capacity (for the jackhammers, tampers, etc.).

The shattered rock, loaded out of the excavation at the rate of 14,000 cubic yards per 22-hour days by two Bucyrus-Erie shovels, a 54-B and a 120-B; was hauled to and dumped on two disposal areas located within a couple of thousand feet. The hauling was done with the same 20-yard Sterling and Western trucks which transported the clay impervious fill across the river to the main embankment.

Bulldozing of the wasted material was done by the contractor's LeTourneau 11-foot-blade bulldozers, mounted on D-8 Caterpillar tractors.

Borrow Areas On Texas Side

The big-volume excavating and hauling job was getting the impervious, pervious and random pervious material out of the borrow pits and onto the main embankment. On the Texas side of the river, a borrow area will supply the 180,000 cubic yards and the 310,000 cubic yards of impervious fill needed around and over parts of the outlet works on the Texas bank of the river. This borrow area had just been opened at

• A Lorain 75-A is employed to pull a smooth roller up and down over top soil which has been placed on the slope of pervious material on the downstream side of the embankment.

the time the job was visited, but was not working.

A total of 2,050,000 cubic yards of material must be moved from a borrow area at the upstream side of the spillway lip. Some 500,000 cubic yards of this will be used for a diversion cofferdam to divert the river through the outlet works early this summer and later to be used as blanket material on the upstream side of the main embankment. The remaining 1,550,000 cubic yards from this borrow area will be wasted in a disposal area also on the upstream side of the spillway lip.

Downstream from the main embankment, and still on the Texas side of the river, are two borrow areas which contain 100,000 cubic yards and 1,260,000 cubic yards, respectively, of impervious material destined to be used in the abandoned stream channel after the Red River is diverted through the outlet works.

Upstream from the main embankment, and still on the Texas side of the river, are a disposal area and another borrow area. This disposal area gets 250,000 cubic yards of slump excavation. The borrow area provides 370,000 cubic yards of blanket and berm material. Neither was being worked at the time the job was visited.

The really spectacular part of Guy F. Atkinson Company's work on the Texas side of the river is the excavation of the spillway, but on the Oklahoma side there are five big borrow pits with at least three performances going on continually when it isn't raining. The borrow pits are literally scattered over an area of several square miles, and a road map, showing haul roads, auto traffic roads and abandoned roads is issued to those who drive trucks or cars within the limits of the contractor's work area.

At the time the job was visited, one of the two 54-B Bucyrus-Eries was operating as a shovel with a 3-yard dipper in a borrow pit, loading out some of the 2,850,000 cubic yards of random pervious fill from this borrow area into 13-yard Euclids at the rate of 6500 cubic yards per 22-hour day.

In the most distant borrow area from the main embankment, one of the two 120-B Bucyrus-Eries, working as a 5-yard dragline, was loading impervious fill into 20-yard Westerns. The impervious fill was a rather sticky clay, but the 120-B dragline was loading out 35 trucks per hour and, according to the contractor's records, it handles 12,000 cubic yards per day of three 7⅓-hour shifts.

The round trip haul from this borrow area is almost six miles to certain portions of the main embankment where fill must be dumped, but the haul roads are so well graded, surfaced and drained that the dump trucks, all of them rear dump, can make about 16 round trips per shift. Considering the fact that much of this distance is on top of the more or less soft fill of the main embankment, these Westerns, as well as the 20-yard Sterling reardump trucks also on the job, have to step right along when they reach the hard haul roads.

High speed, large capacity excavating and hauling equipment enables the Guy F. Atkinson Company to move a lot of material quickly in good weather, but often the weather was a lot dryer than the fill on the main embankment or in the borrow areas. This was particularly the case on the impervious fill section of the embankment. Even at best, prior to compaction, the impervious fill with its optimum content of 18% to 20% water was far from being a high speed boulevard. Truck flotation was, therefore, extremely important.

Truck Equipment Important

The 20 Sterling diesel trucks, were 10-wheel jobs with 14.00x24 tires on their eight rear wheels and 13.00 x 24 tires on their two front wheels. The 20 Western trucks, also diesels, were 10-wheel jobs with 16.00 x 24 rears and 13.00 x 24 front tires. The 12 diesel Euclids, were 6-wheelers with 21.00 x 24 rear tires on semi-trailers and tractors and 13.00 x 24 front tires on the tractors. Even with such doughnuts to float on, there were many times when loaded trucks were so completely mired that it took one D-8 tractor pushing and another pulling to get them out of the muck.

The 16 Dodge 4-yard hydraulic dump trucks with Anthony hoists, were used not only for hauling fill to the main embankment, but also, and more frequently, for hauling crushed stone, spalls and gravel.

Special duty trucks included two Western "water wagons" with 4,500-gallon tanks; two Sterling "water wagons" with 3,000-gallon tanks; three Ford flat rack trucks for town service,

• General view of Denison Dam's outlet works stilling basin taken in June, 1941. Intake structure construction operations can be seen in the background.

• Impervious material for embankment fill is loaded out of a borrow area by a Caterpillar elevating grader.

drill crew service and shop service for the Sterling and Western trucks; one Ford dump truck for odd jobs; a rolling service station, mounted on an International 50 chassis, described later; another International truck for hauling fuel and lubricating oil to every piece of automotive equipment on the job; and 23 pick-up trucks of various makes, mostly Fords, Internationals and Dodges.

Five Caterpillar Diesel No. 12 auto patrols displayed their versatility as one-man roadbuilders and maintainers on the many miles of haul and auto traffic roads which traversed the contractor's work area, for the high-speed traffic of heavy units made constant attention to the roads necessary.

Scattered around the job were 24 Caterpillar D-8 diesel tractors, busy at bulldozing, pulling sheepsfoot rollers, towing and pushing carryalls, getting trucks out of the mud and making themselves generally useful. Miscellaneous clean-up work and odd jobs were handled with two D-4 Caterpillar diesel tractors and one gas-powered Cletrac.

For hoisting and clamshell work the contractor used a 10-ton Browning crane with a 25-foot boom, the equipment being mounted on a Mack truck. This rig came in rather handy when a temporary bridge across the Red River was washed out in a flood and had to be rebuilt in a hurry.

But here we have a lot of impervious, pervious and random pervious fill excavated from the spillway, the embankment foundation stripping and various borrow pits, and hauled at high speeds to be dumped on the main embankment. What happens then? That's one of the things that worried Guy F. Atkinson Company's executives.

Special Rollers Built

All of this fill, after being dumped and bulldozed out smoothly on the main embankment, had to be compacted thoroughly. And the compacting had to be done in the same high speed manner between rains as the excavating and hauling. C. E. Ferguson, master mechanic of the Guy F. Atkinson Company, studied all available commercial sheepsfoot rollers at the start of the job and came to the conclusion that he would have to build the kind of rollers he felt would be necessary for the work that had to be done.

So he put machinists to work and built five 4-drum sheepsfoot rollers with each drum five feet in diameter by five feet long, the assembly weighing about 60,000 pounds when the drums were filled with water. These were used on impervious and random pervious fill. Three more 2-drum sheepsfoot rollers with the same size drums, weighing 30,000 pounds when full of water were also built for use on pervious fill. For the smoothing of the main embankment slopes, a 2-drum smooth roller was made. Each drum of this roller was five feet in diameter by 10 feet long, the assembly weighing 50,000 pounds when the drums were filled with water.

Any of the rollers could be pulled on the level by a D-8 tractor, and the 2-drum rollers could be pulled up the embankment slopes with a D-8. For final smoothing off of the slopes with the 2-drum smooth roller, it was pulled up and lowered down the slopes with a drag line operated from the Lorain 75-A, the heavy tongue of the roller being supported on two doughnut tires. Compacting that could not be done with rollers was handled with eight Chicago Pneumatic Model "4" tampers.

Another special job that the contractor had to do was to build a temporary pile bent, steel span bridge 650 feet long across the Red River below the site of the main embankment. In October, 1941, a flood came down the valley and washed away the northern 400 feet of the bridge, but during the time the watersoaked embankment was drying out, the structure was rebuilt with a minimum of interruption to excavating and hauling operations.

Six portable gasoline pumps were used on the job, one 8-inch and two 6-inch Sterlings; two 2-inch Jaegers; and one 2-inch Gorman-Rupp. Water supply for dampening fill, for the shop and other purposes came from four drilled wells, in which were placed four Pomona deep well turbine pumps, two of 500 gpm and two of 350 gpm capacity. These pumps supplied a 10,000-gallon steel tank elevated on a 55-foot-high pile bent tower.

Crushed rock, which was permissible for use in toe drains instead of gravel, and spalls for the protection of the upstream side of the embankment, were imported by rail from a quarry 65 miles away in Oklahoma. Shipped in hopper bottom cars, the crushed stone and spalls were dropped into a Barber-Greene receiving hopper beneath the siding tracks and fed from the receiving hopper with a Barber-Greene plate feeder onto a 100-foot-long Garlinghouse Brothers rubber belt conveyor. This conveyor carried the material up to the top of, and discharged into, a 40-yard wooden storage hopper, from which it was chuted into the 4-yard Dodge

HOIST THE LOAD, RAISE THE BOOM, WHILE SWINGING

Independent boom control saves seconds on material handling work. Independent boom control permits accurate spotting of forms and buckets. Hoisting while swinging or traveling saves more seconds. Raising or lowering the boom while swinging or traveling is a second-saver. With Koehring Cranes on the job waste motion is reduced to a minimum. Every move is a productive move ... be it traveling, hoisting, loading or unloading, spotting buckets, steel or forms. The many time-saving advantages of Koehring means speed on the job ... more production per hour.

KOEHRING COMPANY • Milwaukee, Wisconsin

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

For your convenience in writing to Kochring Co., you will find a card bound in this issue.

trucks for transportation to the embankment.

Construction labor was divided into three shifts per day for a 6-day week. Each shift was 7 hours and 20 minutes long. An average of 600 men were on the payroll.

The contract, on which work started May 22, 1940, was officially scheduled for completion on May 10, 1944. Penalties for failure to complete various portions of the job, such as diverting the river through the outlet works, by certain specified dates were of different amounts, varying from $100 to $500 per day. Nevertheless, despite rainy weather and floods, the contractor has kept ahead of schedule and as we go to press the job is 45% complete.

Complete Maintenance Program

Important in keeping such a big job, involving so many pieces of equipment, on schedule was the design and construction of specialized equipment and the maintenance and repairing of all equipment. For this purpose the Guy F. Atkinson Company erected large shops in the work area of the project. These shops include a motor overhaul department; a tire repair and retreading department; an automotive electrical department; a diesel fuel pump repair and testing department; a blacksmith department; a welding department; a salvage department; and an ultra-modern machine shop, complete with the latest types of lathes, drill presses, planers, milling machines, toolmaking equipment, etc.

The main shop building has an overhead travelling crane with 200 feet of track. At convenient locations throughout the shops are outlets for oxygen and acetylene, the acetylene being generated on the premises. Also spotted at strategic points are 110 volt, 220 volt and 440 volt electric outlets for portable lights, electric welding, electrically operated tools, heavy machine drives, etc. All lathes, drill presses and the like are operated with 440 volt current. Electrical energy is purchased from the Oklahoma Power and Light Company and comes in at 11,000 volts, being stepped down to 2,300 volts for the operation of the electric excavators, and so on down to 110 volts for illumination and lightweight tools.

Under the jurisdiction of the welding department there are nine stationary electric welders and two portable electric welders. Here, too, is a huge pre-heating furnace, fired with oil. In the tire repair and retreading department are complete sets of retreading moulds for all sizes of tires used on hauling equipment. Since some of these tires cost $1500 each, it is no wonder that every effort is made to keep them in usable condition. In the salvage department, not only parts but also complete units are reclaimed and put in working order.

• An "on-the-job invention" was this tractor-mounted truck bed cleaner used to free sticky material from the inside of hauling trucks.

So complete is the shop equipment that it is building motor-generator assemblies for the generation of electric power to operate the 120-B Bucyrus-Erie machines when they finish their work at the Denison Dam and are shipped to the northwest coast of the Olympic Peninsula, in Washington, for work on a recently awarded contract where electric power is not available. For these motor-generators the contractor is using Caterpillar D-17,000 8-cylinder V-type diesel motors of 160 horsepower, which were removed from Model A Tournapulls employed on a prior contract.

When the weather is dry enough for equipment in the spillway, borrow areas and on the embankment to operate, all trucks are taken off the job in rotation every other shift and brought into the shop for a thorough greasing and a careful inspection. Control records are kept so that no truck is allowed to skip its turn in the shop, and additional control records insure that adequate attention is given to each vital part.

During each shift three mechanical department field service crews are on the move constantly, covering the entire work area, inspecting all equipment, making temporary repairs, and watching for conditions which might make major repairs necessary. All equipment, except shovels, which requires overhauling or major repairs is taken to the shop. On rainy days the equipment is even more thoroughly checked and repaired, particularly any shovels which might need attention, yet cannot conveniently be brought to the shop.

Between the 7 hour, 20 minute shifts there is a 10 minute intermission, during which each oiler goes over his shovel or dragline equipment on an inspection tour before his shift starts digging. The remaining 90 minutes are used for three half-hour shut downs, one in the middle of each shift, during which time the oiler lubricates his shovel or dragline.

"On-the-job" Servicing

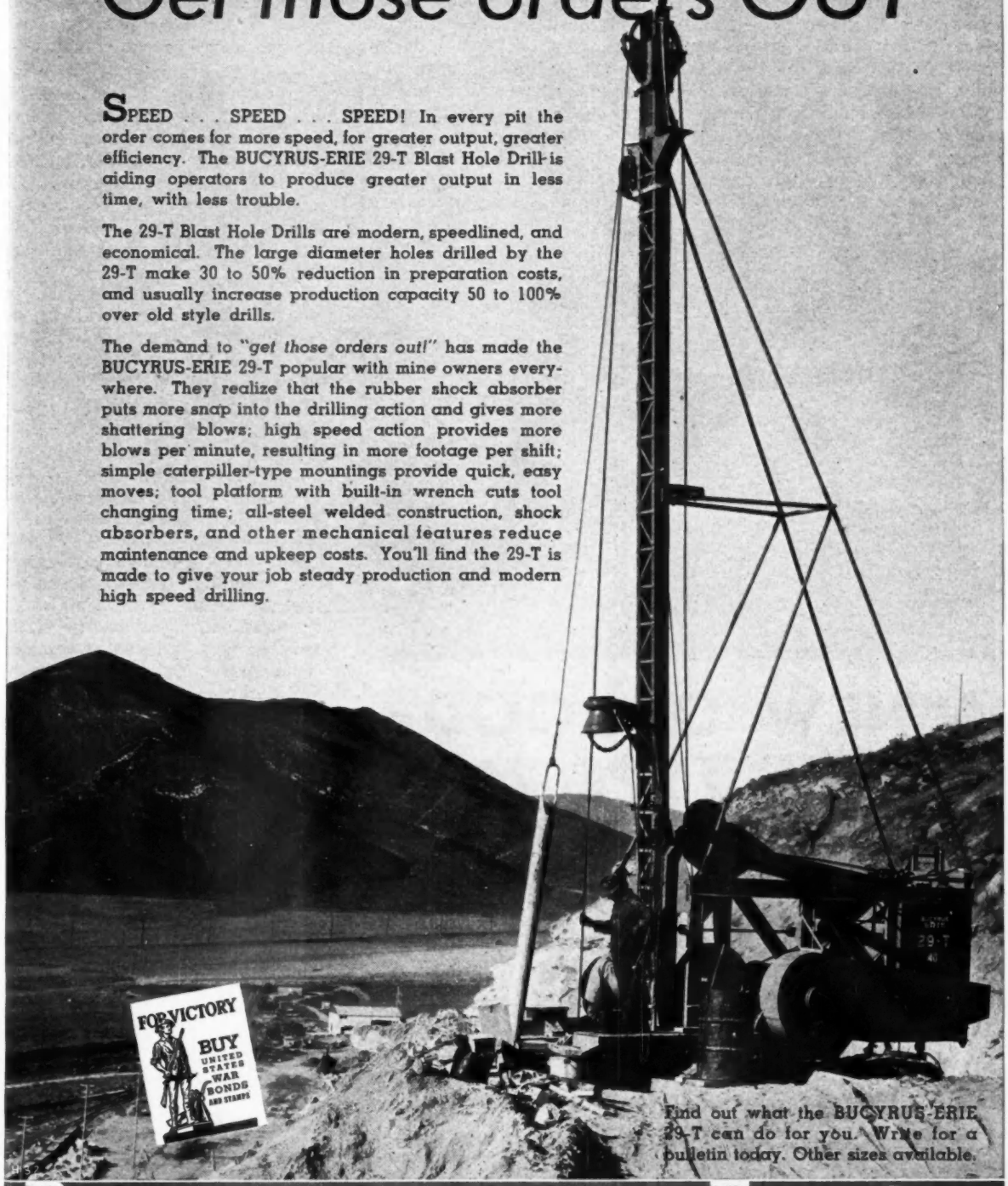
Working out of the shop, two of these service crews attend to

"Get those orders OUT"

SPEED . . . SPEED . . . SPEED! In every pit the order comes for more speed, for greater output, greater efficiency. The BUCYRUS-ERIE 29-T Blast Hole Drill is aiding operators to produce greater output in less time, with less trouble.

The 29-T Blast Hole Drills are modern, speedlined, and economical. The large diameter holes drilled by the 29-T make 30 to 50% reduction in preparation costs, and usually increase production capacity 50 to 100% over old style drills.

The demand to *"get those orders out!"* has made the BUCYRUS-ERIE 29-T popular with mine owners everywhere. They realize that the rubber shock absorber puts more snap into the drilling action and gives more shattering blows; high speed action provides more blows per minute, resulting in more footage per shift; simple caterpiller-type mountings provide quick, easy moves; tool platform with built-in wrench cuts tool changing time; all-steel welded construction, shock absorbers, and other mechanical features reduce maintenance and upkeep costs. You'll find the 29-T is made to give your job steady production and modern high speed drilling.



Find out what the BUCYRUS-ERIE 29-T can do for you. Write for a bulletin today. Other sizes available.

Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Sterling and Western trucks, and one of the service crews takes care of all tractors, compressors and the Euclids. Inasmuch as the trucks all come into the shop for regular greasing and inspection, the truck field service crews use two of the flat rack Ford trucks which do not carry special greasing or other lubricating equipment. But the crew which services the tractors, compressors and Euclids has the previously mentioned rolling service station on an International 50 chassis. This rolling service station carries everything needed to service tractors, compressors and Euclids, and even to help out on shovel servicing occasionally, although most shovels and draglines are well taken care of by the oilers. The service trucks carry no fuel except that the rolling service station carries a small amount of gasoline for starting engines.

Fuel and lubricating oils are supplied to all equipment, trucks, tractors, compressors, Euclids and shovels by an International tank truck, which shuttles back and forth between the storage tanks in the shop area and the various pieces of equipment.

Among the numerous pieces of equipment made in the shop, in addition to the previously mentioned rollers, are two exceptionally rugged scarifiers which are pulled by the D-8 tractors, and a truck cleaner. This truck cleaner isn't for washing purposes, but is used to scrape sticky material from the inside of truck bodies on the Sterlings and Westerns. It consists of a welded wide boom replacing the dipper of a Tracksson shovel mounted on an RD-4 Caterpillar. On the outer end of the boom is a horizontal blade just wide enough to fit the width of the truck bed. The truck operator raises the front end of the body and the tractor operator comes up from the rear, guides the scraper up the truck bed and cleans out the sticky earth just like grandma scraping a griddle with a pancake turner. A lot of the mud comes out on the blade and the rest falls out when the truck driver raises the body to full dumping position. An elevator on the front of the RD-4 provides different angles of attack for the cleaner blade. Cleaning a truck body this way takes about a minute.

Officers of the Guy F. Atkinson Company are: Guy F. Atkinson, president; George H. Atkinson, vice-president; A. E. Holt, vice-president; E. L. Kier, vice-president; Ray H. Northcutt, secretary. Officials in charge of all or parts of the project are: A. E. Holt, vice-president and general manager; A. H. Steiner, general superintendent; C. E. Ferguson, master mechanic; F. R. Bonner, assistant manager; J. H. Waugh, office manager; E. P. Harris, chief timekeeper; G. I. Kambestad, field engineer; R. S. Kerr, office engineer; Walt Hill, Ben Dow and Joe Canto, shift foremen; A. L. Main, chief electrician; J. J. Nunn, equipment engineer; and B. A. Wheeler, assistant master mechanic.

A NEW OSGOOD — THE TYPE 70

OSGOOD is keeping pace with the needs of Contractors and Industry, in the development of the highest efficiency in excavating and materials handling machinery. Be sure to check on OSGOOD developments.

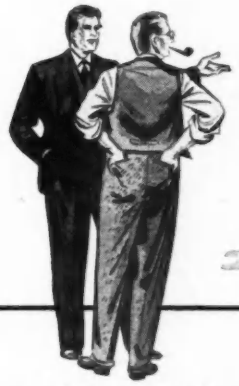
Another new OSGOOD Air-Control Power Shovel and Crane is now proving itself on many jobs. New features make this machine, on either crawlers or pneumatic tired wheelmount, the best buy of the year. Even though our production schedule is now full—we would like to tell you about the 70—you surely will want one later.

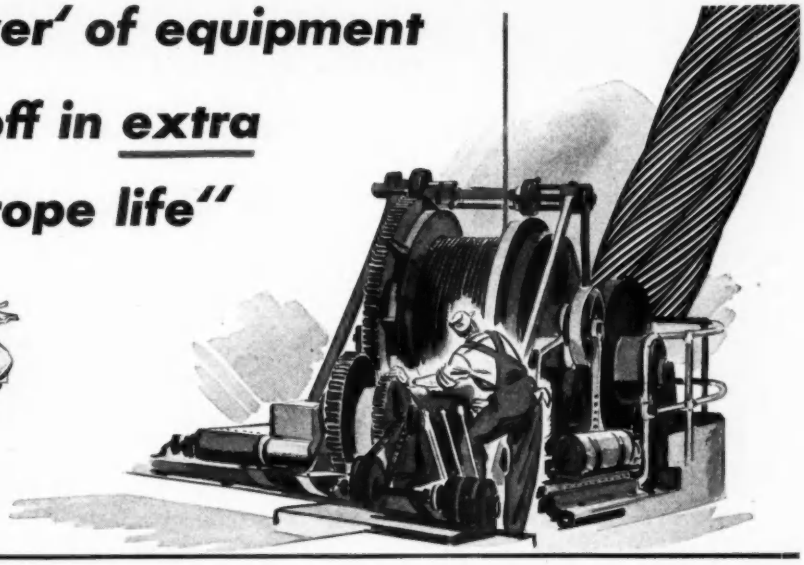
The GENERAL EXCAVATOR CO. Sizes: ¾ - 1½ - 2½ - 3½ DIESEL - GAS - ELECTRIC — Associated with THE OSGOOD CO.

The HERCULES COMPANY HERCULES "IRONEROLLERS" 6 to 12 Tons Diesel or Gasoline — Associated with THE OSGOOD CO.

OSGOOD Sizes: ½ to 2½ Cu. Yd. Diesel-Oil-Gas-Electric — SHOVELS DRAGLINES - CRANES Crawler & Wheel Mounted — THE OSGOOD COMPANY, Marion, Ohio

"This 'once-over' of equipment pays off in extra wire rope life"





"If you're out to get a full measure of service from your wire ropes, it's just good, common sense to check the equipment it runs on. Not just when you get around to it, but regularly —carefully and often. Make a close check-up when a new rope is installed ...and then check again, frequently—*before* the rope starts to show signs of wear. Take a crane, for example, with a worn sheave.

It will go right along handling every bit of work it always did. But that sheave will cut and squeeze the wires ...and the rope will be through, long before its time.

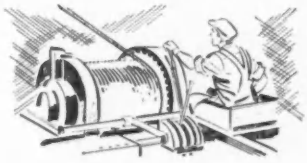
Here are some of the things to look for—some of the reasons why you often hear an operator blame the rope when it was really his own equipment that shortened its life.

First, see if any sheaves are out of alignment. Then check for deeply worn grooves with a gauge,—like this...

The grooves may be scored by an old rope or one of them may have a broken rim that calls for replacement. Sheaves may turn hard or wabble because of worn or damaged journals. That's tough on your ropes, too.

It's easy to realize the jerk or shock at the fastening when a wire rope whips. Vibration has the same kind of effect, building up a great many small shocks. Too much play in the rope may be to blame...even a bent shaft.

Check for displaced or faulty rope guards. Then find out from the operators if there are any clutches that stick or grab...loose bearings or anything else that causes the pull on a rope to be uneven or jerky.



And remember to consult your wire rope manufacturer on any special problems. There are local representatives near you who have practical experience in ferreting out any "bugs" in your equipment that may be keeping your wire ropes from delivering a maximum of service."

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

For your convenience in writing to John A. Roebling's Sons Co., you will find a card bound in this issue.

NOT in the *Contract*

"Where does this inviting shady lane lead to?" asked the motorist.

Without moving from his contented rest upon the fence, the farmer launched a jet of tobacco juice with deadly effect upon a grasshopper ten feet away, then scratched his stubbled chin thoughtfully.

"Well, stranger," he drawled, "It's led mor'n half the young folks around these parts into a right smart heap o' trouble."

A young man whose father had been hanged was faced with filling out a life insurance application form. After the usual questions inquiring about hereditary diseases there was one asking for the cause of death of his parents.

He pondered and finally put down this answer: "Mother died of pneumonia. Father was taking part in a public function, when the platform gave way."

Running after women never hurt anybody—it's catching them that does the damage.

A father surprised his eleven-year-old with a bike for his birthday. Mother and father watched proudly as the boy rode around and round the block. On his first circuit he called, "Hey, mom, no hands." Going past the second time, he shouted, "Hey, mom, no feet." The third time around, "Hey, mom, no teeth!"

An unobstrusive gentleman in the museum was gazing rapturously at a huge oil painting of a shapely girl dressed in only a few strategically arranged leaves. The title of the picture was "Spring." Suddenly, the voice of his wife snapped: "Well, what are you waiting for? Autumn?"

"Where'd that crane operator get that 'Keep 'Em Flying' stuff, can't he give us time to assemble this on the ground?"

Noble Experiment

"Now, children," said the teacher, "I want you to watch this experiment carefully, and you will learn a valuable lesson."

She then held up a glass containing a quantity of pure water and another containing a small quantity of whiskey. "See," she said, "I will put this earthworm in the water; watch it." The worm seemed quite happy.

"Now," she continued, "Watch as I transfer it to the whiskey." As soon as the worm touched the whiskey it rolled over and died.

"Think hard, children," she continued. "What lesson does this teach us?"

After a moment Johnny raised his hand. "I know, teacher," he said. "If you have worms you had better drink whiskey."

Boss—Ben, I wish you wouldn't sing at your work.

Ben—I wasn't working, sir; I was just singing.

"When I was a little child," the sergeant sweetly addressed his men at the end of an exhaustive hour of drill, "I had a set of wooden soldiers. There was a poor little boy in the neighborhood and after I had been to Sunday school one day and had listened to a stirring talk on the beauties of charity, I was soft enough to give them to him. Then I wanted them back, and cried, but my mother said, 'Don't cry, Bertie; some day you'll get your wooden soldiers back.' And, believe me, you lopsided, mutton-headed, goofus-brained set of certified rolling pins, that day has come!"

Druggist to Joe Hangover: "Shall I fix you a Bromo?"

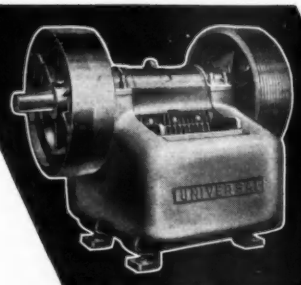
Joe Hangover: "Ye gods no! I can't stand the noise."

A young man and his fiancee had wed and were spending their honeymoon at a large hotel. When bed time came the bride went to bed and the groom sat by the window and gazed at the moon and stars. The bride called to him and asked:

"Why don't you come to bed?"

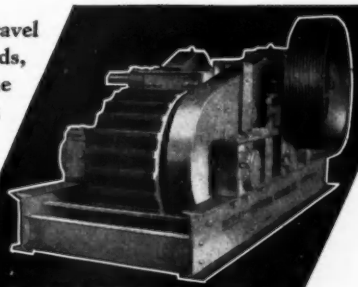
He replied: "My mother told me my wedding night would be the most beautiful night of my life, and I'm not going to miss a minute of it."

"V" is for Volume, too!

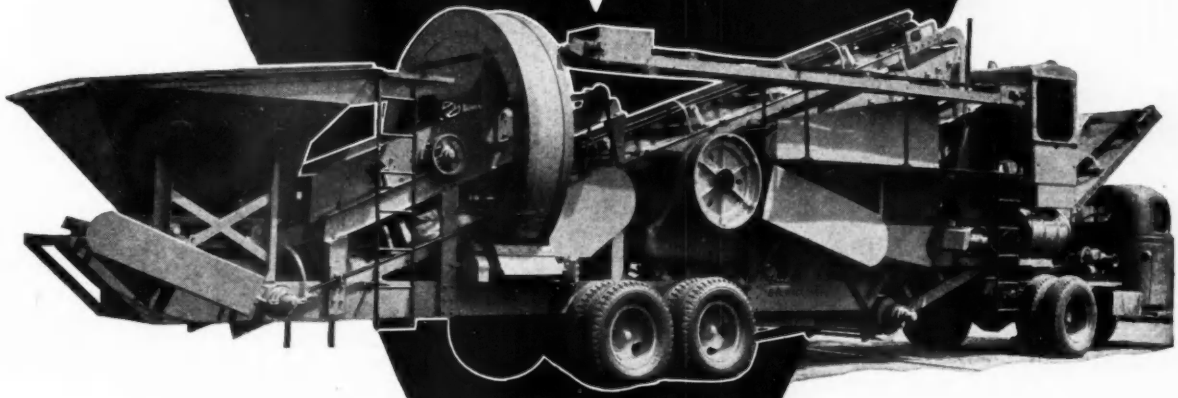


A Universal "Streamlined" Crusher cuts the overall weight of the mobile Gravelmaster Crushing, Screening and Loading Plant without sacrificing strength or production. Sound engineering design—6 roller bearings, 2 on pitman and 2 on each side of frame; faster, more uniform crushing.

The Volume of crushed rock and gravel we need to build defense roads, airports, camps — the Volume you'll get at the lowest cost per yard of crushed material and with minimum maintenance costs if you've got a Universal Stationary or Portable Crusher or Crushing Plant *"on your side."*



A Universal Roll Crusher provides for secondary crushing in the Gravelmaster—quick change manganese steel roll shells. Product held to size. Timken bearings on main shafts, simplified drive, more than rugged enough to stand up under the hardest rock, year after year—one of the main reasons why the Gravelmaster has any plant its size and weight licked on output.



The Universal Gravelmaster

No "excess baggage" in the Gravelmaster — every pound of weight counts. Rotavator, rotary elevator, cuts conveying cycle 30%. From pit to truck in far less time. 4 sizes: 9'x16' crusher, 18x16 rolls; 10'x24' crusher, 24" x 16" rolls; 10'x36' crusher, 30"x18" rolls; 10' x 36' crusher, 40"x24" rolls.

Contractors and aggregates producers operating profit-proved Universal Rock and Gravel Crushing Equipment are supplying material for roads, runways and concrete to army camp, airport, ordnance and defense housing projects.

Universal builds a complete line of bronze and roller bearing crushers, roll crushers, pulverizers, screening, washing, conveying and storage equipment and over 50 types of complete portable, semi-portable and stationary plants. They assure "Volume for Victory."

UNIVERSAL CRUSHER CO., 610 C Ave. W., Cedar Rapids, Iowa

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADERROLLERS, PORTABLE ASPHALT PLANTS

For your convenience in writing to Universal Crusher Company, you will find a card bound in this issue.

Shots from the FIRING LINE

Road Equipment Restricted

A recent amendment to limited preference rating order No. P-19-e, which is issued for highway projects, restricts the use of any preference rating under such an order for the purchase of construction equipment. Henceforth preference ratings applicable to highway projects may be used only for obtaining material which will be physically incorporated into the road project, and of repair parts for construction equipment.

A rating assigned by the P-19-e order should only be used for repair parts when the same cannot be obtained by means of the preference rating assigned by preference rating order No. P-100 in time to prevent suspension of operation of the construction equipment. These provisions become retroactive and apply to orders previously issued as well as those in the future.

Accordingly, it is now necessary to make application on form PD-1A for all equipment purchases as well as purchases of materials, other than repair parts, which are physically incorporated into the particular road project in question.

Anderson Ranch Dam Operations Underway

By Frank H. Spencer

Construction of Anderson Ranch Dam, the $13,050,000 structure that will harness the powerful south fork of the Boise river and supply power and water to the sparsely-settled lower section of Idaho, is underway. Progress to April 1, was nearly 17 per cent, with the project set for completion by the summer of 1944.

Congress has already appropriated $6,250,000 toward the dam's construction, allocating $2,500,000 in March after a request had been made by Representative Henry C. Dworshak of Idaho. The project is under control of the U. S. Department of Reclamation.

The contract was handled as a joint venture, with Morrison-Knudsen Company of Boise, as sponsor. Others joining in the bid were the J. F. Shea Company, Inc., of Los Angeles, California, Ford J. Twaits Company, of Los Angeles; and Winston Brothers Company, of Los Angeles. Participations were also extended to Henry J. Kaiser Company, of Oakland, California; the General Construction Company of Seattle, Washington; and McDonald & Kahn, Inc., of San Francisco, California.

• **General view of excavation work in progress in the downstream portion of the right abutment of Idaho's Anderson Ranch Dam. Moving dirt from left to right are a Lima dragline and Bucyrus-Erie and Northwest shovels.**

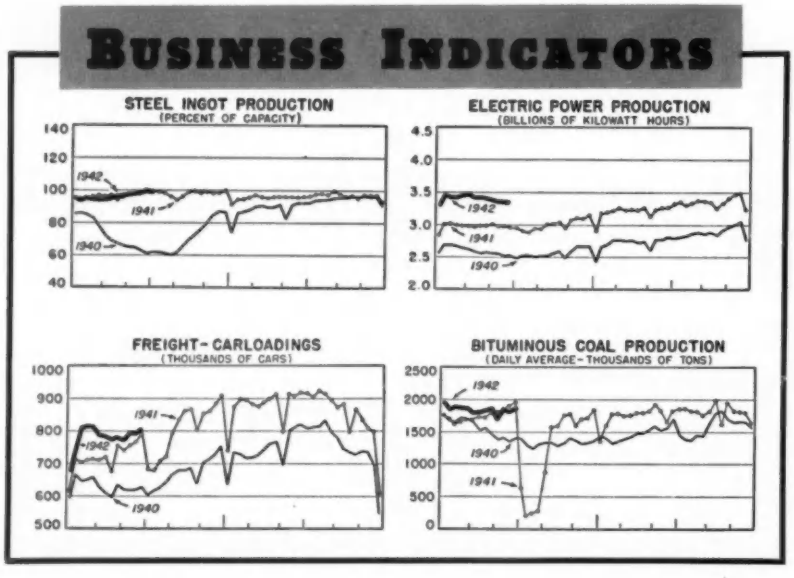
The contract has been staffed with Morrison-Knudsen personnel, with V. A. Roberts as project manager, W. N. Woodall, superintendent; and F. H. Peavy, project engineer.

Four main features of construction are involved:

1. An earth and rock fill dam embankment involving 9,600,000 cubic yards of materials.
2. Outlet works, including a tunnel 1,500 feet in length.
3. Concrete spillways.
4. Powerhouse and equipment.

The dam embankment is to be a rolled earth fill approximately 320 feet above the river bed, and 444 feet above the underlying rock formation. In cross-section, the dam will conform to the usual earth fill type of dam, with a semi-pervious zone of material on the upstream face, a core of compacted impervious material, and a downstream zone of pervious rock material.

One feature of the construction involves the excavation of a core trench, amounting to 1,200,000 cubic yards, which will be 200 feet in width down both abutments and across the bottom of the river bed to expose the decomposed rock. Two concrete cut-off walls will then be constructed into the sound



This is number 10 in a series of informative articles prepared by Macwhyte Wire Rope Company. The purpose of this series is to help wire rope users in these critical times to get the longest possible service from present ropes . . . through making useful facts on rope care more widely known.

CORROSION IN WIRE ROPE

Corrosion is one of wire rope's worst enemies. It strikes without warning. It often reaches an advanced stage before being noticed. And even though checked it still leaves its imprint of destruction.

We can better understand corrosion (and how to prevent it) by knowing what it is, what causes it, where and when it is likely to strike.

What Corrosion Is

The dictionary defines corrosion as "an action of eating or wearing away by slow degrees; a gradual decay by crumbling or surface disintegration; a gradual breaking down of the material attacked."

Two General Classes

There are two distinct types of corrosion:

Acid corrosion, and

Alkaline (or salt) corrosion.

In the case of acid corrosion the wires become pitted and stress concentrates at the reduced cross-sections where pits are located. This causes premature failure of the rope.

In the case of alkaline, or salt corrosion, the wires become encrusted with a layer of the products of corrosion. The rope becomes rust bound, for example. Alkaline corrosion increases the size and weight of the steel wires.

Acid and alkaline corrosion both may occur when ropes are operating in (or subjected to) ordinary atmosphere or weathering, or special conditions which subject the rope to either acid or alkaline substances.

What Happens When Corrosion Sets In?

When this occurs the rope loses its flexibility. Then some of the wires are overloaded, which causes them to break. This is the "beginning of the end" for the entire rope. It starts to wear away rapidly.

No Way To Determine Rope's Safety Once Corrosion Sets In

Corrosion, probably the most severe type of deterioration, is the most difficult to evaluate. Ordinarily when internal corrosion has taken place, external corrosion is also present. But it is impossible to accurately estimate by any known means the remaining strength or safety factor of the rope once corrosion has set in.

More Information

The next advertisement in this series prepared by the Macwhyte Wire Rope Company will discuss ways of preventing corrosion, or in those cases where corrosion has gotten a start how to check it from doing further damage.

Feel free to write us on this, or any problem you may have. We are ready at all times to do whatever we can to help you get the most from your wire rope.

* * *

VICTIMS OF CORROSION!

These ropes never had a chance to live a full and useful life. Left unprotected against the elements, they were attacked and needlessly destroyed by the ever present wire rope saboteur: corrosion.

A very good example of Alkaline Corrosion. Notice how outside wires are partially eaten away—a rope unfit and unsafe. Crown wires have broken up. The other side of the rope next to the sheave has few broken wires . . . but if flexed in the opposite direction they would also break.

This rope was exposed to acid fumes which caused the wires to become brittle. This reduced their fatigue resistance and resulted in the wires breaking while bending over sheaves.

Macwhyte Company Manufactures:
MACWHYTE PREformed and Internally Lubricated Wire Rope
Monarch WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Cable
MACWHYTE Braided Wire Rope Slings
MACWHYTE Aircraft Cables and Tie Rods

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rock, and the excavation replaced with selected impervious materials.

The outlet work consists of a lined tunnel 20 feet in diameter, a bulkhead gate, hoisting mechanism, trashracks, etc. The outlet has been designed for use as a diversion tunnel during construction operation.

The spillway structure on the left abutment of the dam will consist of two radial gates, discharging water into a concrete-lined channel 90 feet wide, down the downstream side of the left abutment. The channel, on a ¾ to 1 slope, discharges into a stilling basin at the downstream toe of the dam. Excavation will involve 900,000 cubic yards of earth and rock.

The structure at the downstream end of the spillway is unique in that the channel is supported on beams and girders, and discharges into the stilling basin directly over the valves of the outlet tunnel.

Reservoir storage capacity will be 500,000 acre feet, with tunnel diversion capacity 15,000 cubic feet per second at 80-foot head. The length of the dam at crest will be 1,500 feet, with width at the base (up and down stream) approximately 2,800 feet.

Principal excavating equipment on the job includes power shovels, trucks, tractors, scrapers and bulldozers. The five power shovels doing most of the dirt moving include one Bucyrus-Monighan 6-W dragline equipped with a 6-yard bucket, one Northwest 80-D 2½-yard shovel, one Bucyrus-Erie 120-B 5-yard shovel, and two Bucyrus-Erie 4½-yard 100-B shovels.

Sauerman Cableway Lifts Gravel From River-Bar to Plant.

MOVE MORE YARDS FASTER FOR LESS MONEY

Where loose materials (such as sand, gravel, blasted rock, ore, etc.) must be dug, hauled, and dumped at ranges from 100 to 1500 ft. the economical way to do it is with a SAUERMAN Scraper or Slackline Cableway.

These efficient machines haul 10 to 1000 cubic yards per hour, require only one operator, and demand little in maintenance. SAUERMAN units have made low cost records on dig-and-haul jobs all over the world for 30 years.

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March Construction Awards

Total construction contracts awarded during March in the 37 eastern states amounted to $610,799,000, according to F. W. Dodge Corporation. This is the highest March total recorded since 1927 and is almost $131,000,000 or 27 per cent ahead of the corresponding month last year.

Each of the three major categories of construction, non-residential, residential and heavy engineering (public works and utilities) show substantial increases over last year on the basis of comparing March 1942 and March 1941 and on comparing first-quarter records of the two years.

Percentage Changes (1942-1941)

	March Increases	First Quarter Increases
Non-residential	15%	28%
Residential	48%	31%
Pub. Wks. & Util. ..	22%	29%
Total Construction	27%	29%

Indication of the progress of conversion of construction to war purposes is seen in the fact that 72 per cent of the 1942 first-quarter dollar total was for public projects, as compared with 47 per cent of the 1941 first-quarter total. In other words, public construction contract volume in the first-quarter of this year was nearly double the volume of the first quarter of last year, while dollar volume of private construction declined about one-third. The freeze order issued by the War Production Board on April 9 will speedily convert practically all construction activity to war purposes.

AGCA Pledges "All Out" War Effort by Industry

H. E. Foreman, managing director of The Associated General Contractors of America, has made public an editorial which appeared in the April issue of The Constructor, official publication of the association. The text of the editorial which is entitled "Construction Goes All Out For Victory," follows:

"The War Production Board on April 9 took what is probably the most drastic step toward converting the nation to a total war effort, except by passage of the draft act, when it issued Conservation Order L-41 providing that hereafter no construction not directly or indirectly for war purposes can be started without specific authority, and when it forecast that some construction already under way might be stopped.

"This order provides that the nation's largest industry and largest single employer, aside from agriculture, shall defer until after the emergency all work not directly or indirectly related to war.

"The order means that from now on the efforts of the industry must be devoted entirely to the successful prosecution of the war. It does not mean, as it has meant to some industries that all units of the industry will be practically guaranteed a part in war production by the government's aid in converting industry facilities for the purpose. It means simply that the construction industry, with few minor exceptions, may do no other work than war work, and that each unit of the industry must find its own place in war construction. in some other type of war production, or suspend operations for the duration, excepting for such minor construction and repair work as is not affected by the order.

"In sections of the country where there is intense war activity, the order will have no immediate effect because of the construction of military or naval establishments, factories, housing or public works. In other sections where there is little or no war activity, the order means the closing down, at least until after the war, of units which cannot move to centers of activity or convert to other types of war production.

"The order now places at the disposal of the government for war construction the full facilities of the construction industry. The industry has a demonstrated capacity for performing at high speed more construction than war agencies have yet scheduled. Any delay in getting projects under way must be considered a responsibility of government.

"The order at the same time places

William R. Ury

William R. Ury, general superintendent for Mason & Hanger Company, New York City, widely known tunnel contractors, passed away suddenly March 22. His unexpected death comes as a shock to his many friends in the industry.

Mr. Ury had been employed by the Mason & Hanger Company for 38 years. Born March 16, 1883, in Mount Pleasant, North Carolina, Mr. Ury started to work for Mason & Hanger as a blacksmith at the age of 21. Holding positions of increasing responsibility, he was finally made general superintendent.

At the time of his death, Mr. Ury was in charge of his company's operations on the Brooklyn Battery vehicular tunnel. Other important jobs that Mr. Ury worked on were: the Lincoln tunnel, Fulton Street tunnel, Rutgers Street tunnel, and various other subway and aqueduct tunnels in New York City.

Mr. Ury also supervised operations on the Rays Hill tunnel on the Pennsylvania Turnpike as well as several dams in New York state. Another recent job that he supervised was construction of an ordnance plant for the Hercules Powder Company in Virginia.

Mr. Ury is survived by his wife Elizabeth, two daughters and two sons.

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Gangway!

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upon the construction industry a heavy responsibility, which is accepted, for the actual performance of war construction with maximum speed, efficiency and economy. With all other work stripped away, the government and the public will expect maximum performance from the industry in its war work.

"The general contracting industry has already pledged to the government full support for the war effort. There is no use pretending that anyone likes the new construction stop order. But there is no question that the industry will do other than reaffirm its pledge to the government, and will continue to strive to its utmost to perform at top speed the construction necessary for victory.

"The order emphasizes particularly to the larger general contractors the necessity of making maximum use of smaller members of the industry both to speed war construction, and to help preserve all units of the industry so that after the emergency they can turn immediately to the tremendous task of post war construction.

"The construction industry is in full accord with all steps taken by the government which will hasten victory.

"The road to victory is a tough one but on behalf of the general contracting industry the Associated General Contractors of America again pledges to the nation all the toughness, ingenuity and adaptability of the industry to winning the war and to rebuilding in peace time."

WPB Prohibits Non-Essential Highway Construction

Effective April 9, 1942, conservation order L-41 prohibits the start of unauthorized construction projects which use material and construction equipment needed in the war effort. It also places all new publicly and privately financed construction under rigid control, except for certain strictly limited categories.

The new procedure goes much further than the SPAB policy announcement of October 9, 1941. In that announcement, it was made clear that no priority assistance would be given to non-essential construction. In the April 9 order, however, it is provided that no construction may be started (except in a few specified cases) without permission.

Three general types of construction are included in the order: residential, agricultural and other construction. Other construction includes commercial, industrial, recreational, institutional, highway, roadway, sub-surface and utility construction, whether publicly or privately financed. Highway and roadway construction may not be initiated without permission of the War Production Board if the cost of the project amounts to $5,000 or more. In computing such costs the amount spent on the project within twelve months of the date of beginning construction and subsequent to April 7, 1942, is included.

It should be emphasized, however, that the order does not affect ordinary maintenance and repair work to return a structure to sound working condition without a change of design.

Although the order applies only to construction not yet commenced, projects already under construction are being carefully examined by the WPB on an individual basis. Such projects may be stopped if the scarce materials to be used in them can be put to more effective use in the war program.

While administrative details are yet

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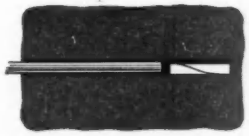
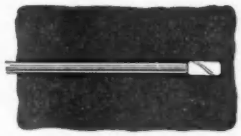
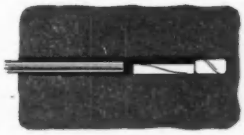


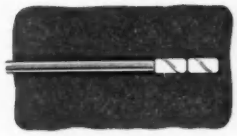
The regular-size cartridge goes in the bore hole. Note the space to be filled.



Pressure from the tamping rod compresses the powder to fill the space.



Another cartridge goes in—Compaction takes place inside the wrapper.



The charge is concentrated for better blasting results.

A-86

For your convenience in writing to Hercules Powder Company, you will find a card bound in this issue.

• An alert shovel operator prevented a truck from plunging over a bank in the Superior Stone Company's King Mountain, N. C., quarry by holding the truck back with his machine's dipper until the truck was pulled away from the edge.

to be worked out it appears that where priority assistance is granted by the WPB, authority to commence construction will be issued by the Director of Industry Operations on appropriate forms of orders in the "P" series. Accordingly, the new order should not appreciably affect present procedures for certifying highway projects and the issuance of P-19-e orders for priority assistance. In other words, the granting of a P-19-e order will carry with it the authorization to commence construction.

At the same time it is important to note that preference rating orders other than the P-19 series will not constitute authority to commence construction. For example, preference ratings extended on PD-1 or PD-1A forms will not constitute authorization to begin construction although such an order normally would provide all necessary materials to complete the project. By way of further illustration, in the event a highway agency has obtained, through priority assistance or otherwise (other than extension of order P-19-e), sufficient materials to complete a project it is nevertheless prohibited from commencing construction under conservation order L-41, unless specific authorization is obtained. Even though no priority assistance is needed it is nevertheless now illegal to commence construction of highway projects over $5,000 without WPB authorization.

Steam Shovel Rescue

E. V. Ragland, secretary-treasurer of the Superior Stone Co., Raleigh, N. C., was the photographer who took this picture of a steam shovel averting a costly accident. The drive chain of the truck broke and the truck was about to plunge over the bank, but the shovel operator, E. H. Crouch, was on his toes. He extended the boom and stopped the truck in the nick of time with the dipper bucket. The incident happened at the company's quarry near Kings Mountain, N. C. (Reprinted from Rock Products.)

Blasting Caps Are Dangerous!

All users of explosives are being asked to cooperate in the movement to protect children from the dangers of playing with blasting caps. Although warnings against allowing these caps to fall into the hands of children are contained in each box of caps, records show that many of them are left lying carelessly about. Those who use explosives can make themselves the most important factor in the movement to save children from injuries and sometimes death by making sure that the caps are carefully stored away where boys and girls cannot get them.

Accidents to children from playing with blasting caps decreased in 1941 as compared with 1940. The desire this year is to eliminate these dangers as completely as possible. This can be done if there is wholehearted cooperation on the part of all.

New Jersey Contractors Pool Equipment

By Bethune Jones

Formation in New Jersey of what was believed to be the nation's first war contract pool of excavating, grading, highway construction, concrete and bridge-building contractors was announced March 27 in Newark, N. J. This group has been awarded Army and Navy contracts of several million dollars, it was stated.

The Utility Construction Co., of New Brunswick, N. J., is the "mother hen" of the group of 33 contractors. It was announced that several contracts had been awarded and others were on the way.

Reeves L. Kennedy, state director of the War Production Board's contract distribution branch, said the Utility Construction Pool Associates had its inception a few mornings after Pearl Harbor. A. G. Preen of Oldwick, N. J., head of Preen Associates, contractors, had an idea that if industrial plants could pool their resources for war purposes, so could contractors. He took his idea to Newark to discuss it with Louis Fenn Vogt, head of the contract divisions pooling unit there, and the plan was started.

"This is an instance of what can be done to relieve distress in industry, at the same time creating powerful assistance to the government in the war emergency," Kennedy said.

"Vogt, who is an industrial consultant, believed these construction companies as a group could well undertake large projects for the government

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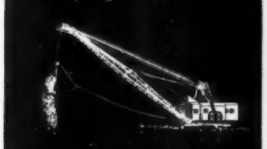

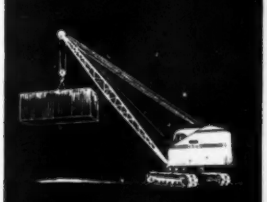

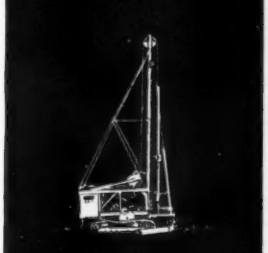

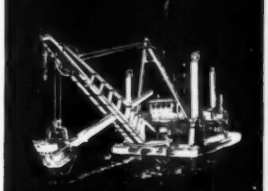

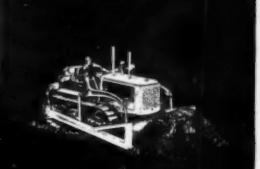

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BUFFALO: Dow & Co., 1820 Elmwood Ave. Phone Delaware 1400.
MINEOLA: H. O. Penn Machy. Co. Phones Flushing 7-4640, Garden City 4440.
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*SYRACUSE: Bucyrus-Erie Company, 303 Draper Ave. Phone 6-1078.
NORTH CAROLINA, GREENSBORO: E. F. Craven Company, P. O. Box 538. Phone 2-1187. L. D. 983.
OHIO, CINCINNATI: Bode-Finn Co., 1654 Central Avenue. Phone Cherry 2833-4.
CLEVELAND: W. T. Walsh Equipment Co., 3088 W. 106th St. Phone Clearwater 4400.
OKLAHOMA, TULSA: Leland Equip. Co., 515 W. Archer St. Phone 4-1114.
OKLAHOMA CITY: Leland Equip. Co., 1726 N. W. 5th St. Phone 2-4550.
OREGON, PORTLAND: Clyde Equipment Co., 17th & Thurman Streets. Phone Broadway 5561.
PENNSYLVANIA, PHILADELPHIA: Bucyrus-Erie Company, 821 Commercial Trust Bldg. Phone Ritterhouse 4281.
PHILADELPHIA: Furnival-Rimmer Co., Lancaster Ave. at 54th St. Phones Trinity 5200 and West 1617.
BRADFORD: Beckwith Machy. Co., 361 Congress St. Phone 3166.
HARRISBURG: Beckwith Machy. Co., 730 So. 10th St. Phone 4-4064.
WILKES-BARRE: Beckwith Machinery Co., 249 Market St. Phone Kingston 7-1111.
*PITTSBURGH: Bucyrus-Erie Co., 1705 Clark Bldg. Phone Atlantic 4815.
PITTSBURGH: Beckwith Machinery Co., 6550 Hamilton Ave. Phone Montrose 4300.
TENNESSEE, KNOXVILLE: Brooks Equipment & Mfg. Co., 408-10 Davenport Rd. Phone 3-7135.
MEMPHIS: Road Builders Equipment Co., Third and Calhoun Sts. Phone 6-6470.
TEXAS, DALLAS: Bucyrus-Erie Co., 1806 Tower Petroleum Bldg. Phone Central 2945.
ABILENE: R. B. George Machinery Co. Phone 6613.
AMARILLO: R. B. George Tractor & Machy. Co. Phone 6185.
DALLAS: R. B. George Machinery Co., 1135 S. Lamar St. Phone L. D. 455.
EL PASO: Tri-State Equipment Co., 500 E. Overland Ave., Phone Maine 1526.
HOUSTON: Gulf Tractor & Equip. Co., 3100 Polk Ave. Phone Preston 4103.
LUBBOCK: R. B. George Tractor & Machy. Co. Phone 3131.
PECOS: Tri-State Equipment Co.
SAN ANTONIO: Wm. K. Holt Machy. Co., West Harding Ave. Phone L. D. 331.
TYLER: R. B. George Machinery Co. Phone 4383.
UTAH, SALT LAKE CITY: The Lang Co., 267 W. First South. Phone Wabatch 6693.
VERMONT, BARRE: Reynolds & Son, Inc. Phones 334—335.
VIRGINIA, RICHMOND: Virginia Tractor Co., Inc., 1628 W. Main St. Phone 5-9138.
ROANOKE: Virginia Tractor Co., 515 Norfolk Ave., S.W. Phone 2-3496.
WASHINGTON, SEATTLE: Clyde Equipment Co., 3410 First Ave. South. Phone Main 1235.
*SEATTLE: Bucyrus-Erie Co., 3408 First Ave., So. Phone Main 6424.
SEATTLE (for Alaska): Northern Commercial Co., 419 Colman Bldg. Phone El. 8830.
SPOKANE: Construction Equipment Co., 1118 Ide Ave. Phone Broadway 5076.
WEST VIRGINIA, CLARKSBURG: General Equip. Co., Inc., 414 N. Fourth St. Phone 3198.
HUNTINGTON: Chas S. Porter Supply Co., 424 Fourth Ave. Phone 2-6651.
WISCONSIN, MILWAUKEE: W. L. Hartley, 2552 N. 89th St., Wauwatosa, Wis. Phone Bluemound 7131.

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BRITISH COLUMBIA, VANCOUVER: Finning Tractor and Equip. Co., 940 Station St. Phone Seymour 7895.
MANITOBA, WINNIPEG: Kipp-Kelly, Ltd., 68 Higgins Ave. Phones 9-2507—9-2508.
NEWFOUNDLAND, ST. JOHN'S: Newfoundland Tractor & Equip. Co., Ltd. Phone 1797.
ONTARIO, TORONTO: F. H. Hopkins & Co., Ltd., Commerce & Transportation Building. Phone Elgin 4094.
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in the way of airports, cantonments, sewers, docks, concrete bridges and highways, asphalt surfacing and the like. None of these contractors alone could undertake projects of such magnitude in the war program, but organized into a pool they could, under strong management. Strong management is always a number one requirement in the formation of pools."

Utility Construction Company was organized by F. C. Schneider and Clarkson P. Steele about 1912. Schneider is president and Steele vice-president. The 33 member companies did a combined gross business of $7,332,000 in 1941. Their facilities embrace 92 pieces of road building equipment, 261 trucks and 211 other units of major equipment. There is available in specialized personnel some 300 engineers, superindendents, foremen and repairmen.

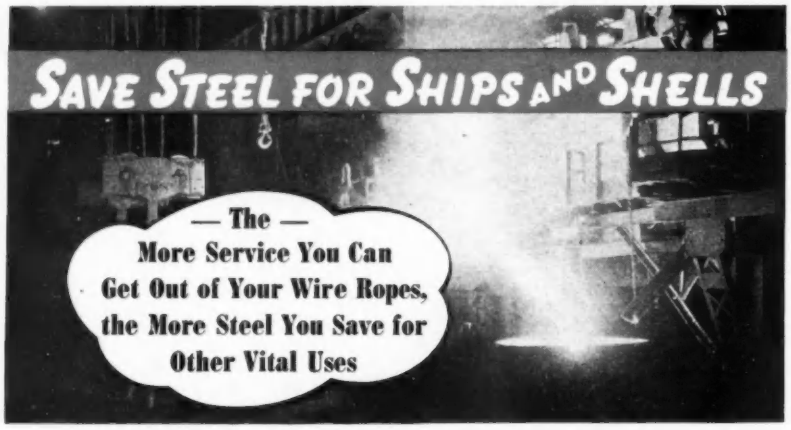
Shasta Dam at Halfway Mark

Marking the half-way point in its construction, the three millionth cubic yard of concrete was placed in Shasta Dam, during March by the United States Bureau of Reclamation.

Shasta Dam is the principal feature of the great Central Valley Project which will aid inland navigation, help control floods, and furnish water and power to agriculture, industries, and cities in northern and central California. When completed across the Sacramento River north of Redding it will be the second largest structure ever built by man, exceeded in mass only by Grand Coulee Dam in Washington.

Construction Engineer Ralph Lowry said that an outstanding concrete placement record has been made at Shasta Dam where the first concrete was poured on July 8, 1940, the one millionth yard on May 3, 1941, and the second millionth yard on October 12, 1941. Although about 200,000 cubic yards of concrete are being placed each month, the 24-hour pouring record of 11,790 yards established on August 9, 1941, remains unchanged.

With the danger of huge floods originating above the dam site greatly reduced because of the advancing season, the contractor is renewing construction activities in the spillway section by resuming concrete placement in the row of blocks adjacent to the right abutment section. Work over the entire spillway section will be continued probably in June, when all danger of destructive flood flows is past.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More Service You Can Get Out of Your Wire Ropes, the More Steel You Save for Other Vital Uses

In the interest of our present National Emergency, we offer the following suggestions:

1. Keep your wire rope using equipment in good condition. Sheaves should be of proper size, design, material — and free from corrugations. Keep all sheaves and idlers properly lubricated and in line. Avoid excessive fleet angles.

2. Keep your wire rope thoroughly and correctly lubricated.

3. Avoid kinks and sudden jerks . . . also, avoid cross-winding on drums, and reverse bends if possible.

4. Make sure your wire ropes operate with an adequate factor of safety. If there is not a proper ratio between the strength of the rope and the maximum load to be handled, the rope may be overstressed — a condition no rope can long survive.

5. Use wire rope of the correct size, construction, type and grade for your particular conditions.

The foregoing suggestions are necessarily brief. We shall be glad to give further particulars to any one interested.

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U. S. Mineral Production

The value of mineral products in the United States last year, estimated at $6,600,000,000 by the Bureau of Mines, increased 18 per cent over 1940 and reached the highest peak in history with the exception of the year 1920, when prices were abnormally high following World War I, according to estimates submitted to Secretary of the Interior Harold L. Ickes by Dr. R. R. Sayers, director of the bureau. National defense requirements, lend-lease activities, and wartime efforts of the United Nations all stimulated the peak demands for mineral products in 1941, according to this report.

Preliminary data collected by the Bureau of Mines, chiefly for use of war agencies, indicated that while a general advance in price levels of minerals accounted in part for the increased value, the major factor was the substantial gain in output of both metallic and nonmetallic products achieved by the nation in 1941.

Many of the mineral products essential for normal needs and for successful prosecution of the war, such as aluminum, magnesium, zinc, iron ore, natural gasoline, petroleum, and coke, were produced last year in quantities never before equalled in the United States. Other important mineral products including coal, copper, and manganese ore showed increases over the preceding year ranging from 4% to as much as 89%. In addition, there was a substantial advance last year in shipments of iron ore, cement, and crude gypsum.

The bureau's estimated $6,600,000,000 as the total value of all mineral products in 1941 is expected to be surpassed in 1942 owing to higher prices and the accelerated demands upon industry for war material, particularly those requiring increasingly greater amounts of steel, coal petroleum, and some of the strategic minerals.

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.

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Spruce Creek Mine

(Continued from page 251)

shovel generally was able to nuzzle them out of the way in the cut. A portable compressor was provided to operate a plugger drill, and occasionally it was necessary to block-hole and blast boulders which were very large, or which were lodged high on the face in such position as to constitute a danger.

Transportation of the equipment to the placer ground on Spruce Creek was something of a feat. Fifteen tons was the maximum lift which could be handled at Atlin and the Bucyrus-Erie stripper weighed just under 100 tons, so it had to be completely disassembled for shipping. The equipment went from Seattle to Skagway, Alaska, by steamer, and from Skagway to Carcross, Y. T., on the White Pass & Yukon Railway.

At Carcross the cars on which the equipment was loaded were run from the tracks onto barges. It was necessary to lay rails on the barges, and also to construct a falsework trestle from the track ashore to the barge.

The laden barges were towed a distance of 70 miles up Tagish Lake by a small steamer.

At the terminus of the portage railroad linking Tagish and Atlin Lakes, falsework was again constructed and the cars taken ashore. They were hauled over the 5-mile portage railway by gas locomotive to Atlin Lake.

Here again it was necessary to construct temporary trestle and to lay rails on barges so the cars could be loaded. Only a small gas boat was available for towing, and a good deal of time was lost waiting for favorable weather before venturing on the tow across Lake Atlin.

At the town of Atlin, falsework was again constructed and the machinery-laden cars put ashore for the last time.

This complicated transportation problem was handled by the White Pass & Yukon Railway in entirely satisfactory manner. The first piece of machinery reached Atlin May 25, 1941, and the last was delivered June 24, 1941. Transportation was arranged to permit partial assembling ahead of final delivery. The stripper and dragline walked from Atlin to Spruce Creek, a distance of about 8 miles, and started mining July 12, 1941. Operations were suspended because of cold weather, October 29, 1941.

Of the elapsed possible time in the interval, 89% was spent in actual mining. The lost time, 11%, was consumed almost entirely in moving the plant, clean-up and particularly in extending the drain through the tailings. Mechanical difficulties were negligible.

Cost of the plant at Atlin, ready to operate, was approximately $200,000. Not a little of this item was freight, which approximated $70 per ton on the ground.

During the initial season, operating cost, with provision for amortizing the investment in eight years, was approximately 40c per yard. The company expects this figure can be reduced with a full operating season.

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GATKE BRAKE BLOCKS are *CUSTOM-BILT* for each make, year and model of Truck, Tractor and Trailer.

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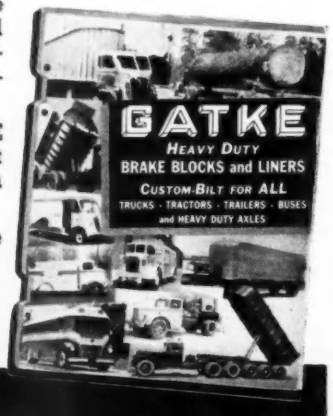

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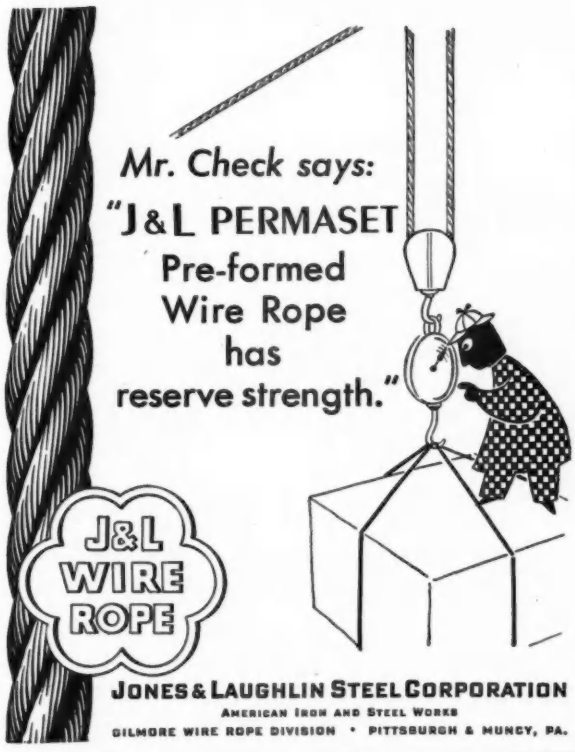

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Notes from the manufacturers

General Electric Company, Schenectady, New York, announces through C. I. MacGuffie, manager of G-E arc welding sales, the production of six one-reel, all-color sound motion pictures designed to help speed war efforts through faster and better training of welding operators. The movies will be titled "The Inside of Arc Welding" and are being produced by the Raphael G. Wolff Studios, Hollywood. When completed, the pictures will be made available to public, private, and industrial welding schools as well as to other interested groups. The first of the pictures were released generally the latter part of April, and others of these will be available about June 1.

Macwhyte Wire Rope Company, Kenosha, Wisconsin, recently held their annual employees and stockholders dinner. A discussion of the year's progress and the company's business was held. George S. Whyte, board chairman and founder, celebrated his 75th birthday and was presented with a handsome plaque in honor of the occasion. The awarding of service certificates for 5, 10, 15, 20, and 25 years was one of the high lights of the meeting.

Gar Wood Industries, Inc., Detroit, Michigan, announces that the following managers have been elected vice presidents of their divisions: W. H. Hammond, sales manager of the hoist, body and tank divisions and director of branches; J. B. Haile, general manager of the road machinery division; G. E. Robinson, manager of the winch division. These newly elected vice presidents will continue their duties as managers of their divisions.

Peerless Pump Division of the Food Machinery Corporation, Los Angeles, California and Canton, Ohio, announces the acquisition of the Sterling Pump Corporation, Hamilton, Ohio, and Stockton, California. The company will consolidate the Sterling plant at Hamilton with the new Peerless manufacturing plant at Canton, Ohio. Sterling's Stockton plant will be merged with the John Bean Manufacturing Corporation, Division of the Food Machinery Corporation, San Jose, California.

New trade literature

Title: **"How to Get the Most Service Out of Industrial Rubber Products"**
Subject: Six of a series of pamphlets dealing with the proper ways to get long service from industrial rubber products. These have been prepared in a vest pocket size format so they will be easy to carry. The series is designed to assist in the tremendous program on rubber preservation now made necessary by war developments. The titles of the series are: 1—Transmission Belting; 2—Conveyor Belts; 3—V-Belt Drives; 4—Belt Salvage; 5—Rubber Hose; 6—Mats and Matting. Each of the subjects is sub-divided into chapters dealing with the various angles of the topic and is written in non-technical language so that job foremen or maintenance men without formal technical education can understand how to best maintain and conserve the precious rubber products now in their plants.
Where to Get: B. F. Goodrich Company, Akron, Ohio. Free upon request.

Title: **"Fastest Method of Low-Cost Paving"**
Subject: A new 12-page two-color bulletin dealing with the construction and operation of the Wood Road-mixer. The bulletin outlines the traveling plant method of low-cost, rapid construction of asphaltic mats and stabilized bases. Information taken from more than 60,000,000 square yards of pavement construction in over 31 states and 7 foreign countries is incorporated in the bulletin. Data was assembled from jobs including the paving of streets, roads, highways and airport and landing field runways. Assembly and construction views are also contained in this interesting folder.
Where to Get: Wood Manufacturing Company, 208 West Eighth Street, Los Angeles, California. Free upon request.

Title: **"Consumers Research Bulletin"**
Subject: A confidential report by Consumers' Research, Inc., devoted to consumer products recommended for purchase. A series of unbiased laboratory tests are the basis for these reports. Products covered range from tooth brushes to pianos, from key rings to automobiles. A subscription to the monthly research bulletin includes an "Annual Cumulative Bulletin" which concerns a more detailed report on products for the year. The bulletins are written in clear, simple language and findings on the products are presented as A, Recommended; B, Intermediate; or C, Not Recommended. The series and annual bulletin are considered important aids to wise buying.
Where to Get: Consumers Research, Inc., Washington, New Jersey. Price, 1 year subscription and annual report —$3.00.

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